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CHARLES A. SEELY, A. M., Editor.

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INDEX TO VOL. VII.

SUBJECTS.

PAGE
Actinism of Snow,...................... 357
Actinometer. The...................186, 438
Address, The Annual,... 434
Adventure, A Photographic,..........30, 163
Advertising by Photographs,............ 45
Albumenized Paper,.................... 174
Amateurs,............................. 285
Ancient Photographs,.................. 78
Aniline Colors,....................443, 521
Athmatype, The........................ 445
Backgrounds,.......................107, 413
Bath, Rectifying, The................. 358
Baths, Disordered,.................... 21
Blistering of Prints,...............61, 459
Borders, Ornamental,.................. 345
Boston,............................... 410
Bromide of Silver,.................... 25
Bromides, Preparation of.............. 85
Camera, The Solar....................7, 538
Canvas, Photographs on....149, 323, 407, 511
Caoutchoucotype, The.................. 570
Carbon Printing,.....37, 42, 226, 308, 366, 449
Chemicals, Photographic,.............. 154
Chloride of Gold...................... 193
Chromic Acid,......................... 350
Cleaning Glass,....................... 309
leanliness, ... 73
Collodio-Chloride,.................274, 465
Collodion, ... 401
“ Dry,................1, 181, 198, 269
“ Formulas for,....................... 173
“ Rapid, ... 158
Coloring,............................. 517
Comic Photographs,.................... 158
Complexion, Rendering of.............. 364
Conservation of Force,................ 127
Controversy, The Conduct of........... 69
Copying, ...20, 115, 138
Corundum Files,....................... 495
Counterfeiting Photographs,........... 165
Date your Photographs,................ 13
Dead Eye, The......................... 382
Decanting *vs.* Filtering,............ 370
Developer, The.........184, 301, 347, 473, 562
Diactinism,........................... 52
Diamond Cameo, The.................... 204
Dishes for Sensitizing Paper,......... 17
Dogtype, The.......................... 259
Double Positions,..............405, 457. 493
Drawing *vs.* Photography,............ 60
Eburneum Process, The................. 517
Ectograph, The........................ 35
Editorial Department, The 23, 47, 71, 95,
6119, 143, 167, 191, 239, 263, 281, 310,
335, 13, 60, 383 407, 431, 455, 479, 505,
525, 540, 572
Electricity, ...44, 116
Enameling Photographs.,...247, 344, 359, 400
Ether,................................ 159
Explosion of Gun Cotton,.............. 22
Fluorides,............................ 112
Focussing, ... 325
Fogging,...........................90, 152
Formulas, ...86. 168
Fuming Process, The.......164, 316, 463, 176

PAGE
Funnel, A New......................... 168
Gelatine, ... 130
Germany, ... 501
Groups,............................... 306
Gun Cotton,....................22, 46, 200
Halation,............................. 421
Harrison, C. C........................ 260
Hyposulphite, A test for.............. 6
Improvement, Signs of................. 166
Indian Ink,........................... 135
Instantaneous Photography,............ 551
Iodide of Silver, Action of Light on,.177, 481
“ “ Solubility of...................... 172
Iodine, A New Source of,.............. 372
Ivory, Artificial,.................... 559
Ivorytype, The.....................11, 476
Light, Colored........................ 428
“ The Lime,........................... 367
“ The Magnesium,...............2, 50, 209
“ The South,.......................... 452
Magnesium Light, The...........2, 50, 109
Maps, ... 412
Methylic Spirits...................... 170
Microphotographs,..................... 151
Microscope, The....................... 59
Miscellaneous,.................39, 279, 393
Mystery, A............................ 566
Natural Colors, The 331
Negative Bath, The.............113, 373, 499
Negatives, Markings on.............361, 385
“ Not to be Sold...................... 231
“ Restoration of...................... 108
“ Scarlet, ...377, 508
Newton's Process,..................... 564
Niellographs, The..................... 285
Novelties,............................ 536
Opalotype, The, 314, 461, 475, 497, 523, 527, 532
Oxygen,............ 104
Paper, Ivory. 53
“ Turning Brown....................... 567
Permanence of Photographs,.........236, 251
Photo-Engraving,...................... 478
Photo-galvanography,.................. 352
Photograph Cabinet, The............... 22
Photographic Societies,............... 503
Photography and the Fine Arts, 127, 161,
191, 512
Photolithograghy,........... ....179, 442
Photozincography, ... 369
Pinholes,............................. 398
Ponton's Chromate Process,............ 224
Preservative Frames................... 396
Printing, Double...................... 203
“ Frames,.....................497, 535, 566
“ Process, The 31, 63, 67, 136, 246,
252, 282, 397, 515, 568,
Relief in Negatives,. 30
Remedy, The Infallible,............... 257
Santonine,............................ 249
Sensitizers and Desensitizers,...521, 543, 547
Sharpness,............................ 234
Silver and Gold, The Recovery of....322, 471
“ The Changes of...................106. 145
Society, The Am. Phot..14, 190, 211, 277,
287, 406, 453, 472, 539

PAGE
Society, The Brooklyn Photo., ... 92
" The N. W. 24
Solar Camera, The 97, 374
Stairs on the Hands, ... 348
Stereoscope, The 197, 217
Stops, ... 54
Strengthening Negatives....122, 184, 320, 409
Tannin, Preparation of 289
" Process, The........220, 332. 337, 557
Tax Law, The 117, 141, 167
Tobacco and Photography, ... 75

PAGE
Toning Process, Tho 190, 230, 371, 427, 470, 477
Transferring 18
Transparencies, ... 302
Uranium, ... 250, 293, 295
Varnishes and Varnishing, 70, 84, 94, 121, 185
Vignettes, ...351, 389
Washing Prints,....10, 129, 162, 252, 498, 501
Water, Distilled, ... 417
Woodbury's Patent, ... 554
Wothlytype, The........206, 265, 346, 445
Yellow Prints, To Restore........ 213

AUTHORS-

Abbott, M. S. 309, 373
Abel, F. A., ... 469
Asser, E. J. 146
Bennett, T. 107
Billinghurst, C. J. 142, 568
Bockett, J. 493
Boltwood, H. L. 1539
Bookhout, E. 398, 566
Brooks E. I. 345
Brown, G. W. 213
Burgess, J. M 517
Calbert, F G. 130
Chameux, L. P. 158, 165
Cherrill, N. K. 499
Clayton, E. C. 245
Craig, W. 369
Crockett, A. B. 347
Cussans, J. 413
Davanne & Girard 63
Davis, L. S. 361
Dawson, G. 220
Divine, S. R. 410
Doty & Stein, ... 370
Draper J. W. 433
Dyball, R. H. 163
Elliot, F. G. 36, 193
Esmay, J. 452
Everard, B. 122
Fitt, G. R. 129
Fox, T. 282
Gaudin, M. A. 90, 109, 217, 308
Gibbs, L. E. 476
Gill, J R. 405
Grasshoff, J. 516
Grant, A. G. 316
Griffing, N. 94, 358
Hart, F. W. 230
Himes, C. F. 521
Hughes, C. J. 332, 337
Hull, C. W. 501, 503
Jacobs, E. 440
Johnson, A. S. 522
" J. 428
" J. H. 17
Keiser, P. J. 1
Kershaw, J. 562
Klein 85
Lacan, E. 149
Lamb, J. 184
Lea, M. Carey
6, 325, 352, 377, 393, 421, 449, 481
Lachman, E. 10
Liebert, A. 323
Liesegang, P. E. 198, 293
Loewe, M. 478
Luca, M. De 200
Mac Nicol, W. 301
Maddox, R. L. 49
Marian, H. J. 259, 285, 306
Marion, M 396
Minerth, C. 61
Medhurst, J. 20
Martin A. 190
Mason, O G. 138
Markillie, J. 474
Matthys, A. 121
Newton, H. J. 564
Nicol, J. 169
Osborne, J. W. 36
Paage, A. 331
Phipson, T. L. 22
Ponton, M. 224
Pouncy J. 366
Reeves, T. S. 427
Reynolds, E. J. 289
Richards, G. H. 419
Roettger, H. 538
Rohrer, H. 477
Rollason, A. 344
Root, M. A. 11, 35
Rood, O. N. 173
Roscoe, ... 186
Rumini, M. 511
Russell, C. 25
Sanders, J. M. 401
Sarony, O. 351
Salvy, M. 136
Sayce & Bolton 181
Schnauss, J. 174, 269
Schering, E. 86
Senior, H. 94
Sesteni, M. 249
Sidebotham 302
Sherman, W. H. 322. 409
Simons, M. P. 232, 447, 471
Simpson, G. W. 42, 54, 112, 295, 465
Smyth, C. P. 116
Spiller, J. 108
Sutton, T. 2
Swan, J. W. 18, 523
Taylor, J. T. 31
Thurber, C. 491, 512
Tunny J. G. 497, 527, 559
Tweedy, G. W. 348
Tyndall, J. 44
Urquhart, A. 246
Vogel, H. 172, 177, 542
Waldack, C. 7, 463
Werge, J. 389
Williams, G. F. 313
Willis G. 346
Woodbury, W. 515, 554
Wothly, H. 265

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New Method of Dry Collodion.

BY P. J. KAISER.

When, some time ago, I wished to employ dry collodion to obtain photographs of astronomical instruments, the processes recommended for preparing collodion gave me very unsatisfactory results. The nature of my duties prevented me from seeking the cause of this ill-success. Some experiments, however, convinced me that most of the substances hitherto employed can give good results only under certain conditions. For example, the results obtained by following Major Russell's process were very different, according as I made use of tannin from one manufacturer or from another. The well known "infusion of linseed" process gives results varying with the age of the seed employed. It is naturally very difficult to determine how old the seed must be to give the best results.

I resolved to try a mode of preparation which appeared to me likely to give good results, in admitting that iodide of silver, when exposed to light, is decomposed into iodine and silver. I have succeeded beyond my hopes, for the plates of iodide of silver, prepared according to my process, have most frequently the same sensitiveness as wet plates. They will keep more than a month without losing any of their good qualities, and the development may be deferred as long after exposure to light. My process requires particularly that the collodion and the nitrate bath yield good negatives by the wet method. I believe that every collodion and silver bath satisfies this condition will give dry plates of good quality, provided the collodion contains only iodides, and that a neutral iron bath has been employed for developing.

These conditions fulfilled, a plate, when ready to be removed from the nitrate bath, is washed in filtered rain water until the liquid flows over it uniformly. Then the plate is washed with the following :

Absolute alcohol	100 parts.
Acetic acid	2 parts.
Camphor	0·50 "

It is desirable that nearly all the water that adheres to the plate be removed by a single washing with the alcoholic liquid. To attain this object, we commence by gently pouring the liquid upon one corner of the plate. A second quantity of the alcoholic liquid poured upon the plate generally suffices to make the liquid flow uniformly. The plate is then left to dry, resting upon a piece of blotting paper, sheltered from wind and dust. The plate will be dry and ready for use in the course of half an hour.

The picture is developed by a solution of

Pyrogallic acid	1 part.
Citric acid	2 parts.
Distilled water	100 "

To which a few drops of a 5 per cent. solution of nitrate of silver is added, or by the iron bath recommended by Valentine Blanchard to intensify negatives. This bath is prepared by dissolving

Sulphate of iron	1 part.
Citric acid	2 parts.
Distilled water	100 parts.

Adding also a few drops of the nitrate of silver solution of 5 per cent.—*Tijdschrift von Photographie.*

Photographs by the Magnesium Light.

THE value for photographic purposes of the light afforded by the combustion of magnesium, appeears by a multitude of experiments to have been fully established, and as the demand for the metal becomes greater and more certain, it is probable that the supply will be more plentiful and regular, and the price cheaper.

The enormous cost of the wire until recently has probably been the sole reason why photographers have not become practically familiar with the highly actinic character of the light evolved by its combustion. The attention of photographers was first called to the subject in our own pages by Mr. Crookes, at that time Editor of the *Photographic News*, who stated in October, 1859, that he had been for some time experimenting with the magnesium light with a view to its application to photographic purposes. In the "Philosophical Transactions," published at the end of the same year, a Memoir by Professors Roscoe and Bunsen, also called attention to the chemical qualities of the light. Since the first mention of it in our pages, we have kept the subject before our readers until the present time, when the increased supply of the wire, and the experiments of various photographers, have placed the application amongst recognized facts.

To Mr. Brothers, of Manchester, belongs the credit of producing the first portraits by the magnesium light, and of working the matter out to an issue of complete success, of which perhaps the experiments at the Royal Institution, on the evening of Friday, May 6th, was the most interesting illustration, when, during a lecture on Spectrum Analysis, and the new metal, Indium, the subject of the magnesium light was introduced. Mr. Brothers then proceeded to take a photograph of Professor Faraday, before the audience, and succeeded in producing as fine a portrait of the venerable *savant* as we have seen, the picture possessing softness, delicacy, roundness, and modelling in a marked degree, and being in nowise inferior to the majority of portraits taken with sunlight, in a glass room, with all the appurtenances and means to boot. The amount of wire burnt was about twenty grains, which at the present price of the metal is something less than one shilling's worth. The negative was at once dried and varnished, and a dry tannin plate being exposed under it to the light given by the combustion of about one-third of a grain of the wire, was developed and completed as an excellent transparency, the image from which was projected on a screen by the aid of the magic lantern and the oxyhydrogen light, and exhibited to the astonished audience in twenty minutes from the period when the negative was taken. A photograph of Sir Henry Holland, taken immediately before the lecture, is equally soft and well modelled.

A series of eight photographs before us possesses considerable interest, as including the first pictures taken by this light. The first is a copy of an engraving, produced by the combustion of about fourteen grains of the wire, the result differing very slightly from one taken by daylight with the same lens, the same materials, and the same exposure; the difference being altogether in favor of that produced by the artificial light, which is more perfectly exposed and more brilliant. The next is a very brilliant portrait of Professor Roscoe, quite undistinguishable from one produced in the glass room by the solar light. The two next are very interesting illustrations of an important application of this light. They consist of portraits from sculptured busts of the late Dr. Henry, and Mr. Hodgkinson, taken in their places in the rooms of the Literary and Philosophical Society of Manchester. The niches in which these busts are placed, are so secluded from solar light as to render the photographing them without removal simply out of the question, and as they in common with many sculptures, could not be removed, photographs of them became impossible without the aid of such a light as photographers now possess in magnesium. Many of the noble monumental sculptures in English and Continental churches and cathedrals, as well as interiors the buildings themselves, now become accessible to the art of the photographer, which have hitherto been beyond the pale of photography.

The plan adopted by Mr. Brothers for illuminating the model, appears to have been very successful. In estimating the exposure, he has been guided rather by the amount of wire burnt than the time occupied in burning it, as the time is of course regulated by the thickness of the wire, and would thus form an uncertain datum. A given weight of wire, however, will yield a certain illumination, whether burnt in a thick wire or a thin one in one piece for a minute, or in four pieces ignited at the same time, each burning at the same time, each burning a quarter of a minute. The chief portion of the wire to be burnt is held, when ignited, at a distance of a few feet from the head of the sitter, a little above and a little to one side, being moved gently about to diffuse the illumination and prevent the too concentrated effect, which a light from a single point has a tendency to give. A small portion of the wire is burnt by an assistant at the opposite side, just giving sufficient light to throw detail into the shadows. If an equal amount were burnt at each side, the shadows would be neutralized, and an effect of great weakness and insipidity would follow.

It is very important that the light should be screened as not to reach the lens. In order to effect this, Mr. Brothers has used a contrivance not unlike a common dust-pan, such as housemaids use. This screen or shield is made of tin, about twelve inches deep, twelve wide at the bottom, and six wide at the top, with the lower portion so curved as to receive the ash of the wire as it falls, which, otherwise, retaining the flame as it drops, throws a light into the camera. Attached to the screen is a handle passing through a piece of wood, something like the guard to a small sword, attached to this is an American clip holding the wire, which is slightly bent, following the curve of the shield. This latter, whilst it screens from the light, also acts as a reflector, aiding to throw the light on the model, and, by a slight inclination, of the reflectors direct the light to different portions requiring especial illuminatiou.

The various applications of this light will readily suggest themselves to photographers. Whilst portraiture by artificial light may possibly not be one of the most common of these applications, it is by no means an unimportant one. Invalids, for instance, who cannot leave their own rooms may now be readily photographed, the products of combustion being so entirely innocuous that no hesitation need be felt in burning this wire in an apartment.

Statuary in unlighted positions, as we have already remarked, is admirably illuminated by this light, the concentrated character of which, and the cast shadows produced, is admirably suited for the effective delineation of sculpture. The examples of Mr. Brothers admirably show this, and the more recent pictures of Mr. Claudet, at the Society of Arts, illustrate, we understand, the same fact. Interiors, tunnels, before impossible to photograph, now become simple affairs, solar camera reproductions and enlargements, and a variety of other subjects, suggests fields in which the photographer may now dispense with his hitherto imperative ally, the sun.—Ed., *Photo. News.*

On the Use of Iodine

FOR DETECTING HYPOSULPHITE OF SODA, AND FOR REDUCING OVERPRINTED POSITIVES.

BY M. CAREY LEA.

Most of the photographic paper used in this country is sized with starch. If we take an alcoholic solution of iodine, and add it to water in very small quantity, a few drops to several ounces of water, the iodine dissolves to a wine-red solution. A camel-hair pencil dipped in this solution, and drawn across a piece of size-starched paper, makes a deep purple mark, which instantly disappears when the paper is plunged into a solution of alkaline hyposulphite.

If, therefore, we take an imperfectly washed print, which still contains hyposulphite, and draw the brush over it, the iodine will not produce the violet coloration, and this affords an easy method of proving the presence of hyposulphite in a suspected piece of paper, either dry or wet. Two precautions are necessary; first, it must be ascertained that the paper in question is sized with starch, which is easily done by examining a fresh piece with the iodine solution; and second, it must be borne in mind that just sufficient iodine solution must be used; a light streak must be drawn with the brush. If the quantity of hyposulphite be very small, compared with that of the iodine as if the slip were plunged into the iodine solution, the iodine would first destroy the hyposulphite, and then produce the violet reaction.

I have used this test, occasionally, for about eighteen months past. I consider it as useful for a sort of rough indication in this way, that, after prints (on paper sized with starch) are washed sufficiently to give the purple streak, an hour or two more makes them perfectly safe.

A solution of iodine is also useful for reducing over-printed positives. It may be brushed over the whole face of the print; or, if it is desirable to reduce only a particular portion, it may be applied to that part only. If, for example, the printing has been pushed so far that in the finished pictures the lights are not perfectly clear, the iodine solution may be brushed over them; or, if the shades have become mere black patches, the iodine may be applied to them. If the print is plunged into the iodine solution, its action is apt to be too strong; the brushing it over produces results more under control. The solution already described may be used, or one of one grain iodine and one grain iodide of potassium to two ounces of water. It is to be remarked that on the applications of these solutions the paper, if sized with starch, turns dark purple. When the desired effect has been produced, the purple color is to be removed by a very weak bath of hyposulphite, after which the print must, of course, be washed as usual.*—*Philadelphia Photographer.*

◆

Enlarged Positives on Canvas.

BY CHAS. WALDACK.

1. Choose canvas uniform in texture, covered with a thick film of white lead called *priming*, and sufficiently old to have acquired a certain degree of hardness. This canvas, stretched upon a frame, must first be so prepared as to allow water to adhere to it over the whole surface, instead of in drops, as would be the case on a greasy body; in other terms, it must retain water. This is effected by either washing it with soap and water containing a small quantity of alkali or of cyanide of potassium, or by rubbing it with a bit of flannel moistened with alcohol.

2. This being done, the following solution is applied to the surface by means of a flat pencil or brush:

Distilled water	25 ounces.
Gelatine	3 drachms.
Iodide of potassium	2 "
Bromide of potassium	1 drachm.

The gelatine is first soaked in water for an hour or two, after which the application of a gentle heat is sufficient to dissolve it.

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* I have never seen this application of iodine mentioned in print, though it is quite possible that it may not be new. I first used it more than a year ago, and communicated it at the time to one or two photographic friends.

This solution is warmed when used; when cold, it congeals.

The canvas is covered with this solution in a room whose temperature is such as to dry the film before the gelatine congeals, it dries in an irregular manner forming lines ad veins.

3. The second operation is the sensitization. It is effected by means of the following solution :

Distilled water	25 ounces.
Nitrate of silver	10 drachms.
Iodide of potassium	1¼ grain.
Acetic acid	2½ ounces.

This solution is prepared in the same manner as that employed in the collodion process, only it must be poured upon the canvas. This operation is performed without producing either stains or irregularities by first removing the canvas from the frame on which it was stretched, and then fixing it in a wooden frame on which a tube of India-rubber has been either glued or nailed. The edges of the canvas rest on the India-rubber tube. By means of four, six, or eight wooden screws, the canvas is fixed in the frame in such a manner as to form a dish, of which the canvas itself forms the bottom.

4. The wooden frame is covered with three or four coats of lac dissolved in alcohol, in order to render it impermeable. The india-rubber tube is first washed with soap and water, and then passed through a hot solution of two parts of white wax and one part of turpentine.

This precaution is intended to obviate the reaction between the nitrate of silver and the sulphur contained in vulcanized rubber. The tube is then attached to the ledge of the frame by means of silver points or tacks covered with wax.

5. In order to sensitize the canvas, raise the dish on one side, as in the sensitizing of collodion plates (*with horizontal baths*), and pour into the lower part a sufficient quantity of nitrate of silver; then, by lowering the dish to a horizontal position, the whole surface can thus be covered with facility. The solution is left on for a minute, whilst the frame is kept all the time in motion, after which the residue is poured into a vial. This solution can be used only once; it is, therefore, necessary to pour on just sufficient to cover the canvas.

6. The focus is adjusted before the canvas is sensitized. The latter is then exposed to the light or the solar camera. The duration of the exposure depends on so many circumstances that it cannot be given with accuracy. We have given from 30 seconds to 5 minutes. The image is slightly visible before development, and so much the more so as the negative is well contrasted with light and shade.

7. The development is made with a solution containing one-quarter saturated solution of gallic acid and three-quarters of water; it is as rapid as when the iron developer is employed in the collodion process. The solution of the nitrate of silver, which has drained off during the exposure to the lower part of the dish, is first emptied into a vial, and then the developer is poured on the surface at one swoop, in the same manner as in the sensitizing.

8. The solution of gallic acid ought to act the same as pyrogallic acid in the collodion process. If it blackens rapidly, and before the picture has completely appeared, either the solution of nitrate of silver contains organic matter, or it has come in contact with the sulphurized rubber.

To prevent the fogging of the whites by too long a development, a very weak solution of sea-salt is poured upon the print. After this the canvas is washed in several waters and then removed from the frame, and the print is fixed in the common solution of hyposulphite of soda. A final washing of five or six minutes is sufficient to remove the hyposulphite.

9. The print must not be fixed whilst it is in the frame, because of the trouble of getting rid of the hyposulphite before the frame can be used again.

10. The frame is washed with soap and water and a little cyanide of potassium, and then rinsed in a large quantity of fresh water.

The nitrate of silver, which has been used, blackens at the end of a few hours; it is then impossible to decolorize it either by kaolin or chloride of silver. In this case it is better to precipitate the silver as chloride, or to evaporate the solution to dryness, and then to fuse the mass, in order to destroy the organic matter.

If the solution is mixed with chloride of silver immediately after it has been used and before it has had time to change color, it undergoes no coloration, and may be used again.

11. As soon as the canvas is dry, it may be put into the hands of the artist, without any other preparation.

Some photographers use the white of egg instead of gelatine. This coating produced a smooth film on which the pencil glides with facility, but it frequently cracks after the painting is finished. Gelatine, on the contrary, forms a dead film, and its adherence is so great that it seems to form a part of the canvas itself.—*Bulletin Belge.*

Washing Prints.

Sir,—Some experiments of mine in washing prints, may perhaps prove interesting to your readers.

There is a laundry implement (an American invention) called a clothes-wringer. The name sufficiently explains the object it is intended to accomplish, and it effects it by *mechanical pressure between elastic rollers.* It occurred to me that the machine might usefully be employed to press out the hyposulphite solution from prints after fixing. I am happy to say it does effect this in a very satisfactory manner. *Experto crede.* All that is necessary is to affix the machine to a tub in the ordinary way, as used for wringing clothes, and then, having a basin of water containing the prints, to take them out one by one, and pass them between the rollers, taking care to prevent them coming creased in the operation. The prints, which are now almost dry, are placed in a fresh basin of water for a few minutes to soak, and the operation of passing them between the rollers repeated. This may be done as often as the operator thinks necessary; but, considering that at each operation, nearly every particle of solution is squeezed from the prints, I should imagine five or six times to be ample, and calculated to free them more entirely from hyposulphite of soda than any amount of washing by any of the ordinary means.

I send you some prints washed (time occupied half-an-hour), by this process, if you should feel disposed to test the fact of their being "free from hyposulphite."

After passing a batch of prints between the rollers, it is advisable to *wipe the rollers dry* before doing so again. Edm. Leachman.

[The plan adopted by this correspondent originated with our esteemed Philadelphia correspondent, Mr. Coleman Sellers, and it is no doubt a good one if applied intelligently; but it is not so efficacious as that introduced by Mr. Hanbury, whose apparatus is now as simple as it is effective, and with which the labor is reduced to a minimum.—Ed.]—*Brit. Journ. of Photo.*

—[The use of the clothes-wringer for washing photographs we believe had a different origin from the one above claimed. So far as we know, it was first described with an engraving, in this Journal, Vol. III, p. 326, Apr. 1, 1861. Will the Editor of the *British Journal* please make a note of the fact?—Ed. Am. Journ.]

◆

The American Ivorytype,

This picture was recently invented and introduced by Wenderoth. It is a colored photograph, finished so as to resemble a miniature or portrait on ivory.

The mode of making it:—Select a vigorous, clearly defined impression, with margin enough to allow for mounting upon the painter's stretcher or painting board. Dampen the print with a sponge dipped in clear water; then paste its edges upon the stretcher, and with a clean paper over its face, rub the print down smoothly. When dry, it will be tight and firm for the artist to operate upon.

Or mount it upon a sheet of glass, with its edges ground to hold the paste.

The photograph is now colored upon the face, as a miniature, with permanent colors; but colors much stronger than those commonly employed on surface-painting, as the manner of mounting the completed pictures upon plate glass has the effect to lower the tone of the colors used.

As transparent colors are reduced, or lose considerably in tone by the mode of mounting, they should be painted-in much more strongly than for surface-painting; while the body colors should be kept down or reduced in tone, since they are heightened, or made more brilliant and vigorous by the manner of mounting.

The colored print is now mounted on a perfectly clean sheet of plate-glass, face downward, as follow: melt bleached, pure white wax, and while hot, pour it upon the glass plate, which is also made and kept hot on a steel or iron plate, or a soapstone slab, under which one or two spirit lamps are continuosly burning. While the wax is quite liquid, take the print by the ends, spring it in the middle, and lower it gently into the heated wax, carefully pressing from the middle outward borh parts of it down into the wax, and then with a straight-edged paper-folder, of ivory, or bone, or some similar article suited to the purpose, press and work out all the air-bubbles and superfluous wax. This operation must, of course, be executed while the plate is quite warm.

The paper-folder should be carefully rubbed from one extremity of the print to the other without lifting it therefrom, or suspending the process, as a mark would thus be left on the picture, which will be thoroughly saturated with wax, and which, if properly handled, will be transparent, smooth, and beautiful.

Some artists use a compound of one part gum damar to eight parts wax; or Canada Balsam and wax; or gum elmer and wax; same proportion of one to eight parts of wax. Others use a larger proportion of the gum-varnishes

Finally the picture is finished, by placing upon its back and firmly sealing to the glass a clean sheet of white paper, or card-board; with a card-board border or mat between the picture and the paper, and with small lumps of hard wax stuck upon the dark or opaque parts of the picture, so arranged as to keep them about one-sixteenth or one-twentieth of an inch asunder. This distance must be determined by effect or appearance produced, and regulated by the judgment of the artist, when the picture is ready for the frame. Sometimes a duplicate *tinted* print of the face is placed behind to give more color vigor.

To produce this picture in its perfection requires the highest degree of artistic skill.—*Camera and the Pencil.*

[Mr. Root appears to be in error in attributing this invention to Mr. Wenderoth. It was patented by Oliver Sarony, April 5th, 1858, and described in this Journal, Vol. I., p. 354. Feb. 1, 1858, we published a process which gives similar effects, and which may be practiced by a person who has little experience in coloring.—Ed.]

Date your Photographs.

Everybody, writes a friend at the West, has his picture taken; and since the photograph is so cheap and universal, everybody will always continue to have it taken. If the invention had been earlier, "every old house, museum, palace, castle, and cottage, would be full of old likenesses; and among them would be the photograph of Luther when he left his father's house for the University, and one at Worms later in life; one of Shakespeare given to Miss Hathaway during their engagement; one of Bonaparte when at the military school : one of Washington when he returned from his western survey : there would be one of Abraham Lincoln taken at a Mississippi village, where his flat-boat was detained a day. But could we identify these pictures ? *Not one in a thousand would have on it the name and the date.*

This is the pregnant text upon which our friend is sure that the Easy Chair could preach two or three columns. But it preaches itself. It is so obvious a duty that we should hope it needed no enforcing, although we know very well that it is a duty often, and perhaps generally, left undone. We say that it needs no enforcing, because, when fully stated, no argument or appeal can strengthen it. If you, good reader, when you next have a card taken, which you privately think is a caricature of your face, will write your name and date upon it, you will really increase its value. And to enlarge the exhortation, please also date exactly all your notes and letters. It is not enough to write Thursday, or June 20th, at the top or bottom. That kind of date has no meaning next year or the year after, and it costs very little trouble to put the figures of the year. The whole subject, brethren, falls under the general head of method and order. A very little care would convert a slattern into into a neat Phillis,and a shuffling, shambling, confused and lazy conduct into a prompt and effective one. A place for every thing, and every thing in its place, is one of the earliest copies upon which we all exercise our powers in pot-hooks. But it is a safe and saving legend for the whole of life. Precision is a habit as well as an instinct, and like all habits it can be cultivated and cherished. Date your notes; date your photographs, and put your name upon them : keep your papers, your letters, your bills, in order, and you will save time, temper, trouble. So mote it be. —*Harper's Monthly.*

The American Photographical Society.

FIFTY-SEVENTH MEETING.

The regular meeting of the Society was held at the University, on Monday evening, June 13th, 1864. Prof. John W. Draper in the chair. O. G. Mason, Secretary.

On the meeting being called to order, the minutes of the last meeting were read and approved.

Professor Seely, chairman of the committee on membership, reported for election the names of Mr. Charles A. Palmer, and Mr. George H. Weeks. By unanimous vote of the Society the candidates were elected to membership.

Professor Seely read a paper upon a new method of correcting the negative silver bath. (See p. 570, Vol. VI.)

Mr. Duchochois thought that whatever organic matter the silver solution contained combined with the oxide of silver used to neutralize the acidity of the solution, and that it was thus discolored by the oxide.

Mr. Newton was asked to give the details of some further experiments upon waxed, or resinous papers. He stated that he had succeeded in producing a good negative from statuary in thirty seconds, and a portrait from life in forty seconds, using the light of an ordinary side window; and outside views in forty-five seconds, through a diaphragm with seven-sixteenth inch aperture. He had prepared his paper with gum benzoin and gum sandarac. The paper was drawn through an alcoholic bromo-iodizing solution. He found that one half ounce of gum benzoin was sufficient for six ounces of alcohol, his developer was two and one-fourth ounces of gallic acid, ten ounces of alcohol, and four ounces of acetic acid. To oneounce of this solution headded two grains of nitrate of silver. The temperature of thedeveloper was about ninety-eight or one hundred degrees.

Colonel Pike considered Mr. Newton's process the best yet given to the photographic public. He had made very fine negatives by the process, and thought that with proper care they might be made in twenty-five seconds; negatives from which as good positives could be printed as were made from ordinary glass negatives; and for its convenience he should highly recommend it to tourists and others. Col. Pike recommended a developer composed of a saturated solution of gallic acid, to each ounce of which he added twenty grains of silver when the picture began to appear. If the image did not develop readily, he then added a little citric acid to the developer.

Mr. Duchochois thought that by the use of pyrogallic acid and warm developer greater increase of sensitiveness would be obtained.

Colonel Pike preferred floating or flooding the picture with the developer, rather than immersion as recommended by Mr. Newton.

Mr. Newton said that by immersion he was enabled to develop six or eight prints at once. He found that the benzoin paper worked well with such development, but that prints by the old wax processes would become spotted if so treated.

The President enquired if the members had used any of the recently published carbon processes?

Colonel Pike had made some very successful experiments with carbon; he had succeeded in transferring the impressed film to plaster and electrotyping it, and he hoped to be able to lay some specimens before the Society at its next meeting.

Mr. Hull laid before the Society a fine photograph of a cast said to have been taken from the face of Shakspeare after death; accompanying the photograph was a letter, from which the secretary read the following extract, in relation to the history of the cast: "There is not a doubt about the genuineness of the cast, for its history is accurately traced from Gerald Johnson, the sculptor of the Tomb in 1616, up to the time it come into the possession of Prince Albert; and indeed it bears upon its face indications of its genuineness. Johnson had it taken, and used it as a model in cutting the bust of Shakspeare. It was subsequently sold to a German Embassador at the Court of England, who took it to his own country, where it was very carefully preserved, and finally came into the possession of Prince Albert, after whose death it was removed to the British Museum, where it was photographed, and now is." The picture though small attracted considerable attention.

Mr. Root of Philadelphia presented to the Society, through Col. Pike, a copy of his recent work entitled, The Camera and the Pencil.

Mr. Hull introduced the subject of providing a building or room for the exclusive and permanent use of the Society; a room in which cases for the cabinet of the Society could be arranged, and upon the walls of which pictures could be hung for exhibition.

Professor Joy moved that a committee of three members be appointed, and named a committee of ways and means; and that such committee be empowered with authority to procure such building or rooms as they might deem best for the interests of the Society; and he nominated for such committee, Messrs. Hull, Mason, and Pike.

After some general discussion upon the means and wants of the Society, the committee nominated by Prof. Joy were unanimously elected.

Colonel Pike called attention of the Society to the "Artists Camera," by Messrs. Stock and Co., saying that it was of entirely new construction and different from anything of the kind ever introduced to the photographic profession. It is so constructed that the artist will find it an indispensable instrument for grouping, models, and architectural subjects. It has a movable front which enables the operator to bring into equal focus, the object without distortion, exhibiting it as it appears to the naked eye, thus producing a picture more natural than those produced in the usual way.

Mr. Mason moved that the corresponding secretary be instructed to transmit to Mr, Root the thanks of the Society for his valuable donation of the "Camera and the Pencil." The motion was unanimously carried.

The Society then adjourned until the second Monday in October next; at which time it is anticipated thot the committee will have secured a permanent place of meeting.

Dish for Sensitizing Paper.

BY J. H. JOHNSON.

In the Year-book of Photography (1864) there is a paper by Mr. Blanchard upon photographic printing, in which he gives a method of constructing a cheap dish for sensitizing paper. I need not quote this gentleman's words at length, it will be sufficient to state, as briefly as possible, what the plan is. Four pieces of dry and well-seasoned board, of the requisite thickness and length, are provided. In each of these plough-grooves are cut the whole length of one side, sufficiently wide to take a piece of plate glass; this being inserted and the sides screwed together, the dish is finished, except that the wood must be well covered with shellac varnish. Five years ago I made a dish in the way described. I used no putty, as Mr. Blanchard recommends, in the grooves, but varnish only. The wood was walnut. I was much pleased with the article, not only because it had a perfectly flat bottom, and thus secured an even action upon the surface of the paper, but because the cost was very trifling.

I soon found, however, that I could not return the nitrate of silver to its bottle, even when I used a funnel, without considerable waste. This discovery greatly altered my opinion as to the rea value and economy of the contrivance, and the result was the banishment of the dish to the society of other useless apparatus, where it remained until the commencement of the present year. On again taking up my dish, I thought it would be possible to make some kind of spout through which to run off the fluid. This idea I did not carry out; for I saw several difficulties in the way which I thought I could not surmount.

I then got a bottle with a good lip and cut off the neck, which was easily done with a hot iron, and after making a hole at one corner, as close to the glass as possible, I cemented the bottle-neck into it with lac. Nothing now remained to complete the work, but to grind-in a stopper. This I did; and now my wooden box with a glass bottom answers every purpose as well as the most expensive dish; indeed, I use one made in the same way for toning.—*Photo. Journ.*

Transferring Negatives.

The following are the details of the method of transferring negatives described by Mr. Swan in the *Photographic News*:—

The negative is taken in the usual manner, and after the collodion film is dry, I warm the plate to eighty or a hundred degrees, Fah. I then place it in a horizontal position, collodion face up, and pour on the following solution at about the same temperature as the plate :—

Gelatine	1 ounce.
Water	4 ounces.
Glycerine	½ drachm.

The quantity applied may be varied according to circumstances, but generally, I find about 1 ounce of the gelatine solution enough for the 8½ by 6½-inch plate.

The proper quantity having been poured on the centre of the plate, I incline it from side to side, so as to cause the liquid to flow over the entire surface and I assist the flowing by a glass rod, using it as in coating sensitive paper, and being careful to avoid the formation of air-bubbles.

When the entire surface of the negative is coated, the plate, if placed perfectly horizontal, may be allowed to rest until the gelatine solution "sets." If, however, the plate is not strictly level, it is admissable to keep turning it slowly during the few minutes that elapse between the coating and setting.

After the gelatine is set, the plate may be placed in a box, or drawer, or closet, out of the way of dust, and where the gelatine coating will become dry, say, in the course of twenty-four hours. After this, I varnish the gelatine surface with lac varnish (vernis Sœhnee, for example), the coating of varnish being applied in the usual manner. When the varnish is dry, I make an incision, with the point of a knife, round the plate, cutting through the coating to the glass, at about a quarter-inch from the margin. I then raise one corner of the sheet and carefully lift it all off.

There are a few precautions to be observed to prevent miscarriage :—

1st. The collodion with which the negative is made should have a good strong body, It is not quite safe to attempt the transfer of a negative made with collodion which produces a weak and porous film.

2nd. The gelatine should be clarified with albumen, and strained through flannel wrung out of warm water just before using; and the straining should be so managed as to prevent the formation of air-bubbles.

3rd. If heat be used after the application of the varnish it should be very moderate, and not continued so long as to produce a brittle dryness of the gelatine.

The glycerine is introduced to guard against this; otherise it is not necessary. I have not quite determined the best proportion of glycerine, but I know that the quantity named in the formula here given answers the purpose.

The collodion surface of the negative is, of course, the proper one for placing in contact with the printing surface. The surface of collodion is surprisingly hard. and, I think, will bear a good deal of wear without abrasion in the act of printing from it; but in the case of any negative from which a very extensive series of impressions might be required, it would, I think, be well to varnish both surfaces; this might be done very easily, by the immersion of the negative in the varnish.

If the transferred negative were used for silver printing, the gelatine side of the negative would have to be placed in contact with the sensitive paper, in order to avoid the reversal of the image; and this is attended with the loss of detail, more or less, according to the thickness of the gelatine film, which, in this case, intervenes between the sensitive paper and the negative image residing in the film.

In proposing the transfer of negatives, I had more particularly in view their application to my process of carbon printing, where the collodion surface of the negative would come in contact with the sensitive tissue, and so the most perfect detail would be secured.

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Photographic Societies.—The photographers in several of the cities of the East, have had meetings lately, preliminary to the formation of societies. The immediate occasion of the meeting s a proposed advance of prices of photographs.

A Delicate Operation in Photography.

You will probably feel considerably surprised at hearing from a stranger, a non-professional one, at that, on such a subject as I am about to introduce; but the fact is, I *hope* that *delicate* operations in photography are better understood in Europe than on this side of the Atlantic. Not that operators in London are *naturally* more skillful than here, but rather because you devote more time and perseverance to experiments of various kinds, and without which no art can be brought to perfection.

What I wish to know is this : I have an ambrotype of an only deceased child, a boy six years old, that is what is termed an "overdone" picture. There is considerable "detail" in it, but it is *too faintly marked as a positive.* I have had it copied by many different operators, and various processes; but, of course, as the lines are very faint both by *transmitted* and *reflected* light, the copies of the camera are inferior to the original. I have also had it copied by the best miniature-painter the world ever produced; but although his work is pronounced a master-piece of art, it is not so decided as I could wish. He has reproduced *all* contained in the original; consequently what I require now is, *some process to improve the original.*

In reading photographic works, I have learned that weak negatives can be strengthened, intensified, &c.; then, what is the reason this ambrotype cannot be further developed, so as to give more of the details, and consequently more of the *form* and character of the departed child ?

Perhaps the trouble lies in the ambrotype's being varnished ? Have you no process that will remove the varnish without injury to the collodion ? Is there nothing that would act as a developer through the varnish when softened, without the risk of taking it entirely off ? I would be willing to risk the destruction of the original, if there were any reasonable probability of success; but would like it tried by experienced hands, and by the best process at present known to the profession.

A gentleman here says it certainly *might* have been made into a very fair negative before the varnish was applied, but that would

12367

be a very hazardous experiment now. However, as experiments that appear difficult or even insurmountable to some, are very simple to others, I thought I would write and ask you to lay the question before the Members of your Photographic Society, for their opinion.

If considered plausible, I would send the picture over by European express, except you can give some simple and effectual plan that could as safely be carried out here. You will naturally think I am over-fastidious, perhaps foolish; but the truth is, an only child is a heavy loss, and if I have any portrait of him, I wish it to be as near as possible up to life. Besides, for the sake of humanity at large, such experiments ought to be tried, and the results given to the world. I will remark, by the way, that ambrotypes are a curse to the public, as people do not find out their worthlessness until too late to remedy the evil. In fact, I see nothing here, in spite of all the recent improvements, that can begin to compare for strength, softness, and perfection of delineation with the good, old-fashioned Daguerreotype. When will the public learn this? JOHN MEDHURST.

NEW YORK, May 1, 1864.

—*Photo. Journ.*

Disordered Baths.

MR. EDITOR—Having some old baths which were worn out by long use, I thought I would try my hand at renovating them. I accordingly added the proper amount of nitric acid, after diluting the bath with an equal amount of distilled water, evaporated and fused; the ambrotype bath was completely restored, working charmingly; the photograph worked equally well, with one exception, the bath was full of long, shining crystals, which left straight marks on the film, or where they crossed one another, stars. Now the bath was not over-iodized, but on the other hand rather under-iodised, and I always watched the plate and took it out as soon as the film was smooth; adding water and then silver did not cure it; will you please enlighten me? EDWIN EVERETT.

[The long, shining crystals, were probably acetate of silver, and indicate that you have used acetic acid in the bath. We should think they would be removed, by evaporating to a small bulk, say one-fourth, and then cooling.—]Ed.

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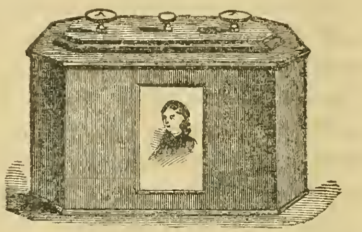
Dr. J. A. Thompson's Photograph Cabinet.

The wood cut represents a very worthy substitute for the photograph album. In the general plan the invention resembles the ordinary stereoscopic cabinet. The cards, attached to a broad tape, by means of the knobs at the top of the box are brought to the window in front for inspection. The number of cards is limited only by the size of the apparatus. The manifest good points of the invention are, that it secures the complete preservation of the pictures, while they are always ready for convenient exhibition.



It is proposed to manufacture the cabinets of such sizes and forms as purchasers may require. Our opinion of the invention is so favorable, that we recommend it to the proprietors of galleries, and we think it possible that it has numbered the days of the fashionable album.

◆

Explosion of Gun-Cotton.

Sir,—I see in the newspapers that a terrible explosion of gun-cotton, accompanied by loss of life, has lately occurred in the works of Messrs. Prentice and Co. It is supposed to have been caused by a spark from some steel machinery. Photographers will remember that a year or so ago, the photographic chemist Dornbach lost his life by an explosion of gun-cotton while packing this substance into a cask by means of a wooden pole. Since that sad occurrence, I have already twice stated that the explosion which killed Mr. Dornbach was evidently caused by an electric spark. Persons who handle gun-cotton are apt to forget, (or, perhaps, are not always aware) that it is one of the most electrical substances known, and that friction, far too slight to develop heat enough to inflame it, will develop in gun-cotton so considerable an electric tension that electric sparks may be obtained from it.

T. L. Phipson, Ph.D., F.C.S., &c.

—*London Paper.*

[We doubt the electrical theory in Mr. Dornbach's case. We have never succeeded in igniting gun-cotton from electricity generated by friction of itself. In Dornbach's case, the gun-cotton was perfectly dry, and heated to a temperature of upwards of 100° under a bright noonday sun; was in a condition to be ignited by the thrust of a heavy stick; such has been our theory from the first. Gun-cotton is very easily ignited by percussion.—Ed.]

Editorial Department.

——The reading of the article on page 13. has induced us again to take out of its secure resting place a fine ambrotype of a little daughter. On lifting the picture from the case, we read again these simple words, written with a pencil in the bottom of the case, "Syracuse, July 18th, 1859." On that day we were detained on a trip to the West, for an hour or two, and of course found it an easy thing to wander into a photographic gallery The ambrotype was the result of the visit, and also the conception of the utility of dating photographs. That journey proved to be eventful, and many times since have we had occasion to refer to the ambrotype for the verification of dates. The dating is a practice we shall not fail to follow and to recommend. Any device by which the dating on a picture could easily be effected would be very useful Suppose the date be scratched on some unimportant part of the negative?

——There are no finer photographs than those on white or opal glass. Wherever they have been introduced they have been popular and successful. We know of several large establishments which have made their principal and most profitable business on such pictures. As to their appearance, they have just one objection, and that is the highly glazed surface, which gives a disagreeable reflection of light. Mr. Thomas Faris, of this city, has, however, obviated this difficulty by a very simple method. He grinds the surface of the glass; and this appears to be all that is necessary. His specimens are admirable.

Minor Correspondence.

N. B., of Ind.—"I had an old silver bath which I precipitated with bicarbonate, and washed the precipitated silver six or eight times in hard water, and then with distilled water slightly; then commenced dissolving with nitric acid; but the acid would only dissolve a small portion, and left the greater part which it would not affect at all. Now what is the cause, and what is the undissolved precipitate? and how shall I manage it for the bath? The bicarbonate was the same as I have before used successfully. ....The probability is that N. B. used the acid too strong. Dilute the acid with five parts water and the precipitate ought to disappear like mist before the morning sun. Whatever remains undissolved in weak acid indicates impurity.

D. W. W., of Iowa.—"I notice on page 510, Vol. VI. of your Journal, that Swan's carbon process is patented in America; is it so? I have taken the Scientific American for some years, which reports the patents weekly. I look sharp for photographic patents, but do not remember to have seen Swan's. It is possible I may have overlooked it. Can you inform me how to prepare bichromate of ammonia for Swan's carbon process (p. 506)?" ....We do not think Swan's process is patented in the United States. In England the patent seems not to be regarded. ..To make bichromate of ammonia. Divide any convenient quantity of chromic acid into two equal portions. Exactly neutralise one portion with ammonia, and then add the other portion.

H. R. P., of N. Y.—"I employed an operator (as I supposed) to take charge of my rooms during my absence. He left a ferrotype plate in the silver bath when he went away, which was a week before I returned. I found some little remnants of the plate. What should I do with the solution? can it be put in working order, and how? How can ammonia-nitrate of silver be brought to plain nitrate of silver solution?" ....Make your bath alkaline with potash or ammonia, and give it a thorough boiling, and the iron will be precipitated. If the bath then does not work clear and bright, try the sunning. ..To convert ammonia-nitrate into plain nitrate, evaporate the solution, and keep the residue in fusion for a considerable time.

D. H. L., of Ills., a new subscriber, says—"I have heretofore been opposed to our photographic journals, from the fact of their publishing so many worthless formulas, but am assured I shall find your's a valuable assistant." ....We do not claim that we publish no worthless formulas. We do claim, however, to publish all the good ones. Like the newspaper editor we print the good, bad, and indifferent; the subscriber pays his money, and takes his choice. Is there any other way? Suppose we should attempt to publish only useful and practical processes, doesn't D. H. L. perceive that our judgment would sometimes err, and that some persons would seldom be satisfied with it? As it is we publish everything, and all the subscrfbers have conferred upon them the dignity of judges, among whom we trust it will turn out that D. H. L. is one of the wisest. When we are slow to publish a useful process or fact, then call us up for punishment: but please don't reproach us for the little nonsense now and then which serves to fill out our budget of news.

J. G. V., of N. Y.—"My negatives have a stringy, streaky appearance. The streaks follow the direction in which the plate is immersed in the bath; if I dip straight down in the bath, the streaks are straight up and down; if I dip cornerwise, the streaks run in that direction. I am beginning to think the bath is out of order. I find it works worse as the day grows warmer. The bath works well otherwise; it works remarkably quick." ....Streaks in the direction of dipping we have supposed to be chargeable to the bath. They may come from a scum on the surface, or from a deficiency of iodizing of the bath. It would be easy to determine which of these two would explain any particular case; but unfortunately there are other causes. Can any of our readers throw light on the subject?

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[NEW SERIES.]

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On the Tendency of Bromide of Silver to Cause Fogging.

BY C. RUSSELL.

[Read at a meeting of the Liverpool Amateur Photographic Association, May 31st, 1864.]

Before publishing the method of preparing tannin plates with bromide of silver, I had worked the process for some weeks with success, but after leaving off and commencing afresh, a strong tendency to fogging showed itself and continued to trouble me for a long time. Sometimes the fogging was but slight, sometimes sufficient to spoil the negatives entirely, and accompanied by great want of intensity and diminished sensitiveness. The results were so variable that it was rather difficult to discover the true cause of the fault, and I was often misled whilst investigating the matter.

Bromine in the collodion, and nitric acid in the bath, failed to keep the pictures clear. Thinking that the bath might be out of order, I tried a new one made with pure nitrate of silver, without improving the results. The only differences in treatment compared with my former method of working, as far as I could perceive, were, that the collodion was more porous and contained a little more water, and that the washing was continued longer, particularly after the application of the tannin, to avoid streaks in the sky.

It seemed probable that the thorough final washing might cause fogging by entirely removing all acid reaction, a little of which might be necessary. It was found on trial, however, that leaving some of the tannin to dry on the film made little difference.

Acetic, formic, and citric acid in the tannin solution were tried without effect. A final wash with water containing about one drop of sulphuric acid in four ounces of water greatly diminished sensitiveness, and seemed rather to increase the tendency to fog. The result of this experiment was so unpromising that I have no repeated it, though I have since seen it recommended. Washing the film, at the removal of the nitrate of silver, with water containing a large proportion of nitric acid and well washing again, kept the pictures clear but very diminished sensitiveness. Removing the last traces of nitric acid, with weak solution of ammonia, and then thoroughly washing, allowed the fogging to appear again slightly, without restoring the sensitiveness. Hydrobromic acid much diluted with water, was poured over the film and washed off again before applying the tannin, and alcoholic solution of bromine was tried in the same way; both without effect.

It seemed possible that the carbonates or other impurities in common water might have some injurious action in long washing. Distilled water was, therefore, used throughout, the last traces of silver have been removed by a weak solution of bromide : no advantage was gained in this way. Different bromides were used in the collodion, but none that were tried produced as clear an image as the bromide of cadmium.

The tendency to fog should not be attributed to the developer, as, although most marked with the ammonia mixture, when this tendency was strong no developer would keep the picture bright.

Different proportions of pyroxyline and bromide were tried : the results varied greatly, according to the nature of the treatment. The effect was tried of varying the strength of the exciting bath, and the time the plates were kept in it (the latter I had already tried some months previously, on seeing an article by Mr. Sayce on the subject); little difference was then seen, because, as now appears, the shortest time was too long for the collodion used. A forty-grain bath was found to give better results with the sample of collodion tried than a sixty-grain bath, and up to a certain point the shorter the time the plate was kept in the brighter the image.

It was found, however, after a few trials, that this was not the only condition required to prevent fogging, as it appeared however short the stay in the bath had been. At last it was found that the extent to which the washing was carried greatly affected the result. Soaking in water for many hours would often cause fogging, even when the action of the bath had been so far from complete that the film had scarcely attained half its full opacity.

The conclusion now appeared inevitable that the bromide of silver required the presence of a trace of unaltered bromide to prevent partial reduction by a developer without the action of light. This explained some phenomena which had appeared during the investigation, but which were not understood at the time. For instance, in trying various proportions of pyroxyline and bromide, when the bath was strong, the immersion long, or the washing long continued, the larger the proportion of pyroxyline the brighter the result; on the other hand with a weak bath, short immersion, and slight washing, a small proportion of pyroxyline gave greater sensitiveness and intensity, because the excess of unaltered bromide was sufficient, but not too great.

The longer the time required for the conversion of bromide than that of iodide seems to depend, in great measure, on the curious fact that the bromide is converted where it lies, uniformly or nearly so through the thickness of the film, whereas the iodide comes to the surface of the collodion to meet the nitrate of silver, and forms a layer which contains but little pyroxyline, and which may often be rubbed off, leaving an almost transparent film of collodion. The larger the proportion of pyroxyline the less permeable is the film of collodion, and the longer the time required for the nitrate of silver solution to penetrate to the back.

To test the matter still further, a number of plates were kept in the bath longer than usual, washed and soaked for many hours to remove any trace of unaltered bromide, coated with tannin, and washed. The first was then set up to dry without further treatment; the next received a final wash of solution of bromide of cadmium $\frac{1}{100}$ grain to the ounce of distilled water, and each succeeding plate was treated with an additional $\frac{1}{100}$ grain.

After exposure and development the first plate was found to be badly fogged; the second was a little better; and each successive addition had made a further improvement. As far as could be judged from one experiment, $\frac{5}{100}$ grain to the ounce—that is, one grain of bromide to twenty ounces of water—seemed to be about the minimum quantity to keep the transparent parts of the image bright, and up to this point there did not appear to be any loss of sensitiveness, rnd little, if any, of intensity. The strongest solution of bromide tried— $\frac{8}{100}$ grain to the ounce—caused very little falling off; the last three plates were, however, treated with a rather stronger developer. It seems probable that the exact amount of soluble bromide required depends on the nature of the developer.

It will require further investigation to determine whether it is better practically to leave a little unaltered bromide in the film, or to remove it entirely and apply the quantity required in a final wash : the latter method, if not attended by any disadvantages, would seem to be the more certain. The samples of collodion first used with bromide alone were all so thick and impenetrable by water, that not only was a long immersion required in a strong bath to convert the greater part of the bromide, but, if any considerable amount of the unaltered salt remained, it could not be sufficiently removed by washing, and great insensitiveness resulted particularly in the thicker parts of the film. This induced me to form the erroneous opinion that the whole of the bromide must be acted on. Even after finding that the last trace of nitrate of silver could be advantageously removed by a solution of a bromide, I was slow to believe that any of the unaltered salt should be allowed to remain in the film.

The conclusion now arrived at agrees with the result of an experiment made long ago. Pure iodide and bromide of silver, and a mixture of the two, were spread on glass and dried, and partly covered with black paper; after a very short exposurre to light, the iodide was unaltered by an alkaline developer, but the bromide and the mixture were not only darkened where exposed, but discolored more slightly where not exposed. This showed that the bromide was not only more sensitive than the iodide, but more liable to fogging.

The entire conversion or removal of the soluble bromide from bromo-iodised collodion, sometimes causes fogging; but this is not a common occcurence, for the plates are seldom kept in the bath long enough for the whole of the bromide to be acted on, and probably the bock part of the film is less easily penetrated by water than in a film containing a much larger proportion of bromide alone. For these reasons the back part of the film gives out a very small trace of soluble bromide during the washing, but the supply is not likely to be entirely exhausted, At the same time the unaltered bromide is not unlikely to remain in injurious quantity in the porous part of the film; this may, however, happen when the immersion in the bath is short and the washing slight. In this way a doubt may arise as to the accelerating effect of a large proportion of bromide. Another circumstance in favor of the iodide of silver is, that it seems when mixed with the bromide to have a special effect in keeping the image clear.

It seems probable, on the whole, that the presence of a little iodide will be found desirable—at any rate, when the highest possible sensitiveness is of no great importance. Merely adding to bromised collodion, iodine enough to let it give it a light yellow tint seems to increase the intensity and brightness of the image considerably, but it diminishes the sensitiveness. The effects of mixing very small proportions of iodine and iodides with bromide under different modes of treatment require further investigation.

Something probably yet remains to be discovered as to the best means of making available the great sensitiveness of bromfde of silver when freed from nitrate of silver and dried.

[Since the reading of this paper we have received the following from Major Russell :—]

The effect has again been tried of adding iodine and iodide to bromised collodion. The iodine caused considerable loss of sensitiveness. One grain to the ounce of iodide of cadmium diminished sensitiveness slightly, and, contrary to the result of former experiments, produced a veiled negative; whilst the bromide, and bromide and iodine, gave very bright pictures. There was but little if any difference in intensity. The treatment of all the plates was precisely similar throughout.

Whether the addition of iodine or iodide salts to bromo-iodised collodion is in any respect beneficial, seems to depend on some unknown condition.

Adventure of a Traveling Photographer.

A PATROL of Cossacks, in the neighborhood of Kowno, came across a wandering disciple of photography. The Cossacks deemed him a suspicious character, and requested him to show his passport. That complied with, they wanted to know what else he had with him.. Our photographer, perceiving that might not right was the order of the day, resignedly opens his portmanteau, full of all sorts of chemicals. A bottle containing a clear fluid, which could hardly be told from their "wutke," next attracts the attention of these sons of the desert. They are not far out, for it is full of alcohol. eighty degrees strength; smelling and tasting are soon done with, and the bottle drained to the last drop. A second and third bottle are also soon despatched—these containing ether and collodion. And now they spied out one more bottle in a snug corner; this one not so innocent—a solution of cyanide of potassium. Eagerly they snatched at it, but the photographer thought that humanity compelled him to prevent any further drinking. By signs he tried to make them understand that the contents were poison, and in proof he pointed at the death's-head on the label. All in vain; they neither heard nor saw anything but the coveted liquid, and the bottle was raised to the lips of one of them. "So far, but no further," cried the photographer in despair, and taking his stick he knocked the vial from the Cossack's mouth, so that the broken pieces and the contents fell to the ground. And now, after tendering their grateful thanks in the shape of a shower of kicks and blows, the patrol rode off disappointed and grumbling at the loss of its piquant cordial.—*Brit. Journ.*

On the Appearance of Relief in Negative Plates.

BY J. W. OSBORNE.

ONE is accustomed to regard the image which is formed in our ordinary operation as having a flat surface. This is, however, as a careful inspection will prove, by no means the case : the negative image is raised and sunk. It is many years since I first noticed this, and I mention it here only because I do not remember ever to have seen anything published about it, although I believe it has been already observed by other operators. This relief is more easily perceptible in photographs with decided lights and shades than in those with much half-tone. It is of such a decided character as to allow of its being impressed on tinfoil. To effect this, fasten the negative with plaster of Paris on to a stone; lay a sheet of tinfoil (in which there is a preponderance of lead) on it, and pass through a lithographic press. (A rolling press would also do.) The glass generally smashes in the operation, but not always. In order to keep these impressions clean, either the plate must be previously covered with gum arabic, or the dust-like pre-precipitate on it must be removed with cotton-wool, else it will deposit itself on the tinfoil, and disturb the relievo appearance. The coating of gum somewhat defaces the relief in the copy, as may be seen in the specimens I now show, in one-half of which the negative was gummed, and the other half untouched.

[Mr. Osborne here exhibited a tinfoil impression on which the relief was very noticeable. The raised parts were so prominent as to have imprinted themselves even on the paper to which the tinfoil was fastened.]

This impression is taken from a negative much intensified with pyrogallic acid, and there is no doubt that this marked relief is produced by the re-development. I have here, however, some other *weak* negatives not redeveloped, which also have traces of relief that may be reproduced on tinfoil. although the appearance is less marked.

In a negative sent me by Mr. George Downes, and which I now lay before you, this appearance is remarkably fine.—*Brit. Journ.*

Positive Printing on Albumenised Paper.

BY J. T. TAYLOR.

THIS kind of paper differs from all others, inasmuch as it has one of its surface, sized, coated, or varnished with a layer of albumen, in which has been previously dissolved a hydrochloric salt, such as the chloride of sodium (common kitchen salt), of ammonium, of barium, or others. When a paper, or a film, impregnated with such a salt is floated on a solution of nitrate of silver, a decomposition occurs similar to that which takes place in a collodion film. Chloride of silver is formed with an excess of the nitrate; and this, on being subjected to the action of light, darkens more or less, thoroughly and speedily.

Whatever the custom may have been long ago,few photographers care, now-a-days, to prepare albumenised paper. The great demand, and consequently competition in connection with it, secures to the buyer an article generally good in quality and moderate in price. Of this fact our advertising columns at all times bear ample testimony. However, for the benefit of those who prefer experimenting on the preparation of albumenised paper the following instructions are given :—

Take the whites of fresh eggs, carefully avoiding the presence of any of the yolk, and to each ounce of them (the white of one average-sized egg measures about one ounce), add from five to ten grains of chloride of sodium dissolved in as little water as convenient, for the smaller the quantity of water present the more highly glazed will the surface of the albumenised paper be; also, the smaller the quantity of salt which has been added to the albumen, the weakermay be the silver bath for sensitising, and *vice versâ.*

This must now be beaten up to a frothy mass. Earthenware pots are manufactured and sold for this purpose, and consist of jars with closely fitting covers, and from the sides of which spikes stick out in considerable numbers for the purpose of breaking the body of albumen in the most perfect manner possible. The albumen having been put into such a jar, simple shaking suffices to convert it into froth in a brief space of time. Where such a vessel cannot be obtained, put it into any convenient dish, and by means of a wooden fork, or a bunch of quills, whip up into a dense froth. This is allowed to stand undisturbed, and after a few hours it subsides into a clear liquid, which must be carefully decanted into a flat dish, of sufficient size to hold the sheet to be albumenised. In this operation it is of importance that no air-bubbles be allowed to be formed. The paper is now arranged alongside, and the face of each sheet is faced in such a position as to ensure no mistake in coating it with the albumen. Each sheet of photographic paper has a right side and a wrong side; and it requires only the exercise of observation and common sense to distinguish between them. The sheet being held by two opposite corners, and bent into a curve, is to be laid down upon the albumen. The centre of the sheet comes first in contact with the fluid; after which, first one side and then the other is lowered down. In this operation care must be taken to avoid air-bubbles, and this is not at all difficult to do when the most ordinary care is taken. The paper, after being allowed to remain for one or two minutes, is lifted up, and dried. The drying should be effected as speedy as possible, either by means of a hot fire or by heat otherwise applied, for on the rapidity of the drying depends, to a great extent, the beauty and brilliancy of the surface.

The paper so prepared will keep good for a long time, and when about to be used must be rendered sensitive.

Make a quantity of the following solution :

Nitrate of silver	60 grains.
Distilled water	1 ounce.

Filter and pour into a flat dish, and in this float—prepared side downwards—a sheet of albumenised paper, the same precautions being observed here as when coating it with albumen. Allow it to remain on the bath for from three to five minutes, after which remove and hang up to dry. For this purpose a rail may be provided with a suitable arrangement for catching the drippings. It is not a bad plan to have a string stretched across the room, each sheet on being prepared suspended by one corner by means of an American clip, a dish being placed underneath. When the second sheet is ready, the first is pushed further along the string and the other is made to take its place over the dish, in turn giving place to the third sheet, and so on. When quite dry it should be put away into a dark place, or between the leaves of a portfolio, until convenient to use it. It is desirable that it be used as soon as possible after being excited. As it is liable to undergo decomposition, a few drops of acetic acid added to the silver bath enables it to keep good for a few days in a dry place ; but in all cases use it as soon after preparation as possible.

The negative being placed in the printing frame, select a piece of paper of a suitable size, and, having placed its face next to the collodion side of the negative, put on the back of the printing-frame, and screw them in close contact. Expose now to light, and those parts of the paper not protected from its action by the density of the blacks in the negative will speedily become more or less darkened. The back of the printing-frame must consist of two parts hinged together. This allows of an examination being occasionally made without disturbing the position of the negative and print; but it is desirable to examine it as little as possible. Print till it is considerably deeper in tone than would be desired in the finished print, as the subsequent operations somewhat "undo" the printing. In short, let it be printed so deeply that your uninitiated friend at once exclaims that the print is ruined by being too dark. It is now transferred to a dish of water, the object of this being to remove all the nitrate of silver from the film, in which its presence is now no longer of any use. How these washings may be utilised and reconverted either into cash or nitrate of silver, will form the subject of another lesson; meantime, keep all your washings.

The print having been washed, is now ready for being "toned," the object of which operation is at once to make the picture more beautiful and more durable. Were it not toned it would, when finished, appear of a red tint, and not at all pleasing in appearance; whereas, by toning, we may obtain tints of almost all kinds —sepia, purple, black or blue. But this is not all; for the toning imparts to the print the quality of resisting the lowering of tone consequent upon the subsequent immersion into the fixing solution, allowing more brilliant pictures to be produced than otherwise could be done; and, as a last advantage, the toning, by causing a deposit of gold on the blacks of the picture, adds very materially to its chances of remaining permanent. The subject of toning solutions has received much attention of late years, and is now reduced to a state of comparative certainty and considerable ease. To reproduce the various formulæ which skill has devised and experience attested, would swell the present lesson to undue length.—*Brit. Jour.*

The Ectograph.

[Patented by William Campbell, Jersey City, N. J.]

The name ectograph was adopted, as giving some intimation of the manner in which the picture was finished; *i. e.* "from behind."

The picture is made as follows :—

Take such a negative as is customary for the solar camera ; *i. e. full in detail, but not dense,* and *wholly without fault.* No pains should be spared in this first step, as every after-step will faithfully reproduce whatever failing there may be.

Place the negative in the copying camera, and turn it towards a clear, though not too strong, north light—the sky being, if possible, made to serve as the background; as every object that intercepts the light, however distant, will palpably affect the resulting photograph. When the sky cannot subserve the purpose, then any purely white object, sufficiently large to cover the negative when at a distance, will answer.

The negative being in a position, the finest French plate glass should be used for the positive. The details of this process may be found in any work on photography.

Supposing a perfect positive to have been obtained, the subsequent process described below is very simple.

The picture may be varnished, or not, at the operant's choice. The application of a clear, good varnish, may possibly be of some utility, though Mr. Campbell says he has tried both methods, without detecting any difference between the results. The positives must now be coated on the collodion side with a thin layer of white wax, and, being held to the light, must be colored either with oil or water colors. If water colors are employed, the wax must be prepared to take the color kindly, by slightly rubbing it over with a little ox-gall, or soap and water. A very little will suffice.

If the operant be unused to coloring, he may first varnish the wax and then color. If he does not succeed to his liking, he can rub or wash the color off, and commence anew. Whereas, without so varnishing, and if the color be laid *immediately* upon the wax, it cannot be removed easily, if indeed at all.

If elaborate work be desired, the lines and shades of the photograph will indicate *where* to put the colors, and taste will prescribe how to arrange them. Dispatch, however, is sometimes of moment, in which case the whole drapery of the figure may with a full brush, be covered in ten minutes with one color, producing an effect as beautiful as could be desired.

Be it noted, that the materials used in this process must be of the best quality, and all the appliances and manipulations marked by perfect cleanliness.

Thus the glass should be the finest plate; the wax should be sun-bleached (as no other will answer); and the colors should be brilliant in hue and not liable to fade. With such appliances and care there need be no apprehension of failure.—*The Camera and Pencil.*

[The Ectograph process was the invention of the writer, who in 1855 applied for a patent to protect it, but by reason of the obtuseness of the patent office examiners a vexatious delay of many years was caused. About four years since the interest in the patent claim was transfered to Mr. Campbell. Friend Root will please make the needful correction in future editions of his book.] —Ed.

Suggestions for a New Pigment Process.

BY FRANCIS G. ELIOT.

Beautiful and perfect are the results accomplished by Mr. Swan in carbon printing, yet there are several tedious and troublesome operations in the manipulation of his process, which will prevent, for the present, I am afraid, professional photographers from taking it up quite as eagerly as might be wished, notwithstanding the much greater security for permanence over our present silver process, the principal of these being :

Firstly, the not being able to have the films prepared as an article of commerce, to sensitize at pleasure, or even being able to prepare them in an establishment on dull days, in readiness for bright weather, as they must be prepared sensitive at once, and will not keep any great length of time.

Secondly, the having to mount every print after it leaves the pressure frame, before developing.

And lastly, the reversal of the image from the numerous negatives now in stock, except by an after process of transfer.

Of course, none of these difficulties are insurmountable, and therefore, as between the profession and the public, it is simply a matter of £. s. d., if the public will pay extra for greater security, the profession will readily meet the wants ; from what, however, I am able to judge of the process, I should say it would not answer to work under five or six times the prices we now charge for silver prints.

I have therefore been led to the consideration, whether it is not possible to devise some process which, while it offers equal advantages as regards permanency, should yet assimilate more closely to the manipulations of our present mode ; namely, the being able to prepare a paper, having the requisite glaze to secure sharpness, which shall keep, and can be prepared as a commercial article, similar to albumenized paper ; which can be rendered sensitive at pleasure ; which will print direct from the negative, and will not require any transferring to bring to its correct position ; and in furtherance of this object, I have been struck with the very great advantage the newly discovered process of M. Poitevin offers to accomplish the end I had in view.

M. Poitevin has found out that if a film of gelatine be submitted to the action of a solution of perchloride of iron, containing some tartaric acid, in the dark, it is immediately rendered insoluble ; but by exposure afterwards to light, it is rendered soluble in proportion to the amount of time the light is allowed to act upon it. This is, I think, much too valuable a discovery to be overlooked ; of course, I need hardly point out to your readers, that if paper is simply prepared with gelatine, and a *black* pigment, and submitted to the action of these chemicals ; if placed under a negative, a negative image would be the result, and we should, therefore, be obliged to print from a transmitted positive, which would also be obliged to be transferred from the glass, to print from the back, to get right and left correct ; a process which would offer no advantage over Mr. Swan's.

I may, however, here perhaps call attention to the valuable use this suggests of *reproducing* negatives by one operation, a process very much in demand just now.

The following would no doubt be the plan: rub a glass over with Mr. Wenderoth's wax in ether, coat with collodion, let dry, then with gelatine containing some dark pigment, even some good non-actinic dye might answer, sensitize in the above acid salt of iron, dry, expose under a negative, develop in warm water, place on the surface while wet a sheet of Mr. Wenderoth's film, and when totally dry, strip all off the glass; it must be removed from the glass, or the image would be reversed; this trouble, although very great, for a number of positive prints, would be nothing for making a number of valuable negatives; if the film be senitive enough for the camera, the copy might be obtained any size, and correct at once on the glass.

But to return to positive printing. The question naturally suggests itself, how to apply this discovery, so as to obtain proofs direct on paper; and as this process reverses the action of the light on the gelatine from that of the chromates, I have thought is it not possible also to *reverse the order of the tones of color*, and instead of printing with a black material on a white ground, to print with a white material on a black ground? I think this offers so many advantages over other plans yet tried, that I hope those who have time will experiment in this direction, and give us the value of their labors. The following I would throw out for their experimental trials.

In the first place, paper might be prepared on a commercial scale by being evenly coated from a lithographic press, with a good purple or brown black tone; for trials on a small scale, purple sealing wax might be dissolved in methylated spirits, and the paper soaked therein; or even dilute stopping out black might do for a rough experiment.* Then the paper should be coated evenly with gelatine, containing some good semi-opaque white color; zinc white, being very fine, might answer best.

So far, the paper might be prepared by the albumenizers, perhaps by machinery like Marion's endless sheets. Then it can be rendered sensitive by floating on the acid salt, same as we now silver our paper; when dry, place under the negative. And here I think there would be an advantage, that working on a *white* material instead of black, we might be able to see something of what we are about.

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* A black glazed paper can be obtained of the fancy stationers, which will serve for experimental purposes.—*Ed. Photo. News.*

The developing can be done in warm water, the same as Mr. Swan's, and any after process that might be rendered necessary, would be the removal of any iron salt that might be in combination with the gelatine that had been unacted upon by the light. Possibly, dilute oxalic acid might be required; but the utmost the iron unremoved would do would be to give a reddish or pink tone to the high light. Soaking in alum and water might indelibly fix the gelatine.

I think I have pointed out nearly all the advantages of this process, if it can be brought to as great perfection as the carbon. There is one more, however, which I cannot help mentioning. In examining the carbon prints exhibited by Mr. Swan, more particularly the landscapes, from my having constantly made a practice of examining stereoscopic slides without an instrument, to see if they are mounted correct, I could not but be struck with the very pseudoscopic effect they had to my eyes, on account of the blacks being raised so much above the high lights. The above would be perfectly free from this fault, and would possess the advantage of having the high lights raised, and the shades to retire, which all artists would commend as being correct, and would more nearly approach to that beautiful process which our present style of photography completely overthrew, but which all old photographers sigh over, as one of the glories of the past, namely, a genuine daguerreotype.—*Photo. News.*

Miscellaneous.

Photography and Art.—Photography has given quite a new impetus to the study of art. It is well known that many of the larger photographic firms have made a *specialitié* of the photographic reproduction of masterpieces. Albert, of Munich, and Michels, of Düsseldorf, applied themselves to eminent living artists. Schauer, of Berlin, publishes a series of admirably finished albums of *chefs d'œuvre* of older artists, for the most part judiciously selected. A photographic copy of Raphael's *Life of Psyche*, in the Villa Farnesina at Rome, has recently appeared from the studio of the Berlin Photographic Society. We saw Herr Michels, not long since, copy a very valuable and interesting document, destined for the great New York Fair for the benefit of the wounded. It bears the dedication—"The Artists of Düsseldorf to the Patriotic Women of New York;" and beneath are the signatures of all the renowned artists of Düsseldorf.

HONOR CONFERRED ON VOIGTLANDER.—The Emperor of Austria has conferred the Cross of the Knights of the Order of Francis Joseph on Peter Wilhelm Friedrich Voigtlander, of Vienna, in recognition of his long service in the promotion of industrial art.

CAST FROM SHAKSPEARE'S FACE.—Photographs of the cast alleged to be of the face of Shakspeare are being published by the London Stereoscopic and Photographic Company. The history is as follows:—"A German nobleman had an ancester who was attached to one of the ambassadors accredited to the Court of King James I. This gentleman was, like many of his countrymen at a later period, a great admirer of the genius of Shakspeare, and, as a memorial of him, bought the cast—in all probability from the sculptor of the tomb, Gerard Johnson—had it carefully preserved, and took it with him to his own country. There it was shown in his castle, and looked upon with much awe by his friends and neighbors. The nobleman who brought it home employed a pupil of Vandyke's to paint the miniature which accompanied it. The mask and miniature remained in the family, and descended from father to son for many generations, until they came into possession of the last of the family, a dignitary of the Church in Cologne.* Dr. Becker (the brother to the Secretary of the late Prince Consort) purchased the cast and also the miniature, and about twelve years since lodged them in the private possession of Professor Owen. It is believed that Dr. Becker subsequently perished in the disastrous South Australian expedition. All the original legal documents connected with this precious relic are likewise in the possession of Professor Owen. Amongst them is a letter from Professor Müller, stating that the Kessalsdadt family kept up a lively commerce in works of art with London for nearly 300 years, and that they had a large collection of the portraits of Gustavus Adolphus, Henry IV., Luther, Melancthon, &c.,

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* The back of the Cast bears the inscription—A. D., 1616.

and that amongst the *savans* who visited the collection, not the least doubt existed as to the authenticity of the Shakspeare relic." Of course we need scarcely say that in default of the cast itself, those interested in its examination will find a very truthful substitute in a photograph thereof.

DAGUERREOTYPE PORTRAIT BY DAGUERRE.—M. Aimé Girard presented, at the last meeting of the French Photographic Society, an object which, in an historical point of view, possesses great interest. This was a Daguerreotype portrait of M. Gosse, an artist, by Daguerre himself, and bearing at the back the following inscription: *A mon ami Gosse; Daguerre. Fait en six seconds, par un temps brumeux, en* 1843. Besides the historical interest attaching to it, this print is worthy of attention on account of its great merit as a work of art. It was examined with great interest by the members present, and M. Aimé Girard thanked by the Society for his communication.—*Photo. Notes.*

A NEW PRESERVATIVE.—A new method of preserving animal matter was described by M. Pagliai, before the Academy of Sciences lately. The author treats the substance to be preserved, whatever it may be, with a mixture of alum and gum benzoin with water. This liquid forms a layer or varnish over the surface of the specimen, which prevents decay by excluding the air. Animal matters preserved in this way are said to resist decomposition completely.

PHOTO-ELECTRIC ENGRAVING.—This new process of engraving has recently received much attention from the press. The *Illustrated News* thinks its production "more beautiful than the finest aquatint yet produced."

NEW PUBLICATIONS.—A very large photograph of Thackeray, said to be the latest taken, will be shortly published by Mr. Ernest Edwards.—Mr. De la Rue has recently isseed a series of photographs of Balmoral Castle, taken by Mr. S, Thompson.—Mr. Eastman, of Manchester, is issuing a series of large photographs under the title of *British Architectural Gems.* The prints, 18 by 16 inches in size, are from tannin plates.—*Brit. Journ.*

SOLUBLE BLUE DYES.—The beautiful blue dyes obtained from coal tar, and which are so familiar to us under the names of "mauve," "ianthine," &c.. as hitherto prepared, are generally bu slightly soluble in plain water. A patent claim was entered b

M. Clavel some time ago for protection for a process by which he can so modify the blue dyes as to render them soluble in water. The inventor dissolves the dye in fuming sulphuric acid, and then pours the solution into water, through which a current of steam is passed. The solution is then precipitated by an alkali or common salt, and the coloring matter which collects in flocculi can be washed and then dissolved in boiling water. The solution may then be used for dying.—*Brit. Journ.*

Curious Personification of Photography.—At a grand Fancy Ball, given a short time since in Paris, by the Minister for Foreign Affairs and Mme Drouyn de Lhys, and which was attended by upwards of 900 persons, one lady personified Photography, being covered from head to foot with portraits, and wearing the *camera* as a *head-dress.—Illustrated London News.*

Restoration of Violet Color.—A lady correspondent sends us the following process for restoring the violet color discharged from silk by acid juice :—"Brush the portion of fabric with tincture of iodine, then after a few seconds well saturate the spot with a solution of hyposulphite of soda, and dry gradually. The color will be perfectly restored."

Cheap Cement.—A cement which is a good protection against weather, water, and fire, to a certain extent, is made by mixing a gallon of water with two gallons of brine, then stir in two and a half pounds of brown sugar and three pounds of common salt ; put it on with a brush like paint. *Query*—Put it on what? We suggest, the inventor's hide.

Are Carbon Prints Permanent?

The question has been asked repeatedly of late, "Are carbon prints really permanent?" One of our correspondents states that he thinks their permanency has been too much taken for granted. He revives an old argument, and states that as the carbon is held by a perishable material—gelatine—and that as both are attached to paper by a perishable cement, such as glue or paste, the term permanent is not justifiable.

We remember, that some years ago, when carbon prints were first talked of, the same argument was used, and it was proposed by one writer to submit them to a solution of caustic potash or of chloride of lime, in order to test their permanency. This on the assumption, we presume, that if the organic basis was thus dissolved, and the picture removed, the permanency was disproved. A very little reflection will show that these arguments or experiments prove nothing to the purpose. That the pictures should be removed by such treatment merely proves that they are destructible, and has no real reference to their permanency. An oil painting might be destroyed by a similar process, but no one dreams of regarding oil painting as wanting in permanency. The paper itself upon which a picture is produced may be destroyed, but the permanency of the picture is not to be impeached on that account. The reproach of photographs has been that they often contained within themselves the elements of destruction or change, or that when subjected to the action of the atmosphere with the gases it generally contains, they lost their beauty or faded altogether. The real question of importance, then, will take this form, "Are carbon prints liable to change or fade under the ordinary circumstances in which such things are kept, as silver prints have been?" When the question is thus put it admits of a very easy answer in the negative. It is unnecessary to dwell here on the permanency of carbon itself; the photographer can, moreover, by using other pigments to vary the tint of the picture, obtain just the same certainty as the painter by taking heed to select permanent colors. The vehicle in which the pigment is held imprisoned, although perishable in itself, becomes, by the action of light and chromic acid, changed in character and converted into a material very analogous to leather, and almost impervious to any cause of destruction to which the picture has any right to be subjected. As for the perishable character of the mounting material, the carbon print stands in just the same relation as regards permanency as any other mounted picture. How far the surface of Mr. Swan's pictures may bear abrasion, or how soon the mechanical difficulties of mounting, now somewhat troublesome, may be overcome, we cannot at this moment say, but we see nothing whatever, at present, either in the materials used, or the manipulations necessary, to suggest the slightest want of permanency or durability in prints by Mr. Swan's process.—*Photo. News.*

Curious Electrical Phenomena.

Prof. Tyndal publishes the following account of some curious electrical phenomena observed by Mr. Watson, and a party of tourists in ascending the a portion of the Jungfrau mountain in Switzerland. Mr. Watson in a letter to Prof. Tyndall says : "On the 10th of July, 1863, I visited with a party of three, and two guides, the Col de la Jungfrau. The early morning was bright, and gave promise of a fine day, but as we approached the Col, clouds settled down upon it, and, on reaching it, we encountered so severe a storm of wind, snow, and hail, that we were unable to stay more than a few minutes.

As we descended, the snow continued to fall so densely that we lost our way, and, for some time, we were wandering up the Lotsch Sattel. We had hardly discovered our mistake when a loud peal of thunder was heard, and shortly after I observed that a strange singing sound, like that of a kettle, was issuing from my alpenstock. We halted, and finding that all the axes and stocks emitted the same sound, stuck them into the snow. The guide from the hotel now pulled off his cap, shouting that his head burned; and his head was seen to have a similar appearance to that which it would have presented had he been on an insulated stool, under a powerful electric machine. We all of us experienced the sensation of pricking or burning in some part of the body, more especially in the head and face, my hair also standing on end in an uncomfortable but amusing manner. The snow gave out a hissing as though a heavy shower of hail were falling; the veil on the 'wide-awake' of one of the party stood upright in the air, and on waving our hands, the singing sound issued largely from the fingers. Whenever s peal of thunder was heard, the phenomena ceased, to be resumed before the echoes had died away. At these times we felt shocks, more or less violent, in those portions of the body which were most effected. By one of these my right arm was paralyzed so completely that I could neither use nor raise it for several minutes, and I suffered much pain in it at the shoulder joint for several hours. At half past twelve, the clouds began to pass away, and the phenomena finally ceased, having lasted twenty-five minutes. We saw no lightning, and were puzzled at first as to whether we should be afraid or amused."

Photographic Eminence.

The photographic art has done a good deal to make people personally acquainted. Everybody keeps a photographic album, and it is a source of pride and emulation among some people to see how many *cartes de visite* they can accumulate from their friends and acquaintances. Young gentlemen who travel on their appearance, have their *cartes* printed off by the dozen, and distribute them under the impression that they are affording a gratification to their numerous friends and acquaintances. But the private supply of *cartes de visite* is nothing to the deluge of portraits of public characters which are thrown upon the market; piled up by the bushel in the print stores, offered by the gross at the book-stands, and thrust upon our attention everywhere. These collections contain all sorts of people, eminent generals, ballet dancers, pugilists, members of Congress, Doctors of Divinity, pretty actresses, politicians, circus riders, and negro minstrels. To the theatrical profession photography is a good advertising medium. The protean actress adorns the doors of the theatre at which she appears, which a highly colored photograph of herself as she appears in private life, surrounded with other pictures in character. The Ethiopean comedian, following suit, has himself taken in fifty different dresses and attitudes. It is an undoubted fact that the continual repetition of a portrait is a good way of advestisiug. The patent medicine and hair oil manufacturers understand this. The labels of their nostrums are half taken up with full-face half-lengths of those gentlemen. And a fine-looking, intellectual, philanthropic class of people they are, if the pictures are correct, well calculated to impart (by the exercise of faith) a healing efficacy, if anything could, to the lard oil, or the molasses and water and snake root which are commonly supposed to be the staple of their pharmacopœa. No pill box is made so small but there is room enough on it for the portrait of the gifted compounder. Portraits of corn doctors, borne around the streets on high, transparent placards, are the latest developement of this ingenious and successful branch of the advertising art.—*Brooklyn Eagle.*

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——The *British Journal of Photography* now appears weekly, and is published in London.

The Chemical Constitution of Gun-Cotton.

BY PROF. F. A. ABEL,

The chemical constitution of gun-cotton, concerning which the opinions of chemists were divided until 1854, has been conclusively established by the researches of Hadow. In the formation of substitution-products by the action of nitric acid upon cotton or cellulose, three atoms of the latter appear to enter together into the chemical change, and the number of atoms of hydrogen replaced by peroxide of nitrogen in the treble atom of cellulose—

$$C_{18}H_{30}O_{15} = 3(C_6H_{10}O_5)$$

may be nine, eight, seven, or six, according to the degree of concentration of the nitric acid employed.

The highest of these substitution-products is tri-nitro-cellulose pyroxyline, or gun-cotton—

$$C_{18}\left\{\begin{matrix}H_{21}\\9NO_3\end{matrix}\right\}O_{15}=3C_6\left\{\begin{matrix}H_2\\3NO\end{matrix}\right.\quad O_5;$$

this being the substance first produced by Pelouze in an impure condition, in 1848, by the action of very concentrated nitric acid upon paper, or fabrics of cotton, or linen, and afterwards obtained in a purer form by Schonbein, who employed, a mixture of concentrated nitric and sulphuric acids for the treatment of cotton wool; the object of the sulphuric acid being to abstract water of hydration from the nitric acid, and also to prevent the action of the nitric acid from being interfered with by the water which is produced, as the chemical transformation of the cotton into gun-cotton proceeds. The formation of tri-nitro-cellulose is represented by the following equation :—

$$\underset{\text{Cotton.}}{C_6H_{10}O_5}+3\underset{\text{Nitric acid.}}{\left\{\begin{matrix}H\\NO_2\end{matrix}\right\}O}=\underset{\text{Gun-cotton.}}{C_6\left\{\begin{matrix}H_7\\3NO_2\end{matrix}\right\}}$$

$$O_5+3\underset{\text{Water.}}{\left.\begin{matrix}H\\H\end{matrix}\right\}O.}$$

The lowest substitution product from cotton, of those named above, appears to have the same composition as the substance which Braconnet first obtained in 1832, by dissolving starch in cold concentrated nitric acid, and adding water to the solution, when a white, highly combustible substance is precipitated, to which the name of *Xyloïdin* was given. The substitution products from cotton, intermediate between the lowest and highest, are soluble in mixtures of ether and alcohol, and furnish by their solution the important material *collodion*, so invaluable in connection with photography, surgery, experimental electricity, &c.

According to Schonbein's original prescription, the cotton was to be saturated with a mixture of one part of nitric (of sp. gr. 1·5) and three parts of sulphuric acid (sp. gr. 1·85), and allowed to stand for one hour. In operating upon a small scale, the treatment of cotton with the acid for that period is quite sufficient to effect its complete conversion into the most explosive product *pyroxilin*, or *trinitrocellulose;* but when the quantity of cotton treated at one time is considerable, especially if it is not very loose and open, its complete conversion into pyroxilin is not effected with certainty unless it be allowed to remain in the acid for several hours. This accounts in great measure for the want of uniformity observed in the composition of gun-cotton and its effects as an explosive, in the earlier experiments instituted; and it is, moreover, very possible that the want of stability and, consequently, even some of the accidents which it was considered could only be ascribed to the spontaneous ignition of the material, might have been due to the comparatively unstable character of the lower products of substitution, some of which existed in the imperfectly prepared gun-cotton.—*Druggists' Circular.*

Editorial Department.

——— Photographers at last are beginning to raise the price of their work. We hear of concerted movements in that direction from most of our large cities. This is all quite right. Why should a photographer receive only the ancient rates, when he is obliged to pay double for everything he needs?

But the new revenue law which goes into force on the 1st of August, will make a change of price almost compulsory upon many, Those who now manufacture cards of celebrities for $25 per 1,000, cannot continue to do so and be honest towards the law.

On and after the 1st of August, photographs of every description are to be taxed. The rates are as follows: For photographs which are copies of engravings, or other works of art, and photographs used for the illustration of books, and for microphotographs, 5 per cent. For all other photographs when the retail price does not exceed 25 cents, 2 cents; when retail price is above 25 cents and does not exceed 50 cents, 3 cents; exceeding 50 and not above $1, 5 cents; exceeding $1 for each additional $1, or fraction of a dollar, 5 cents. The wise photographer on the 1st of August will be provided with a complete assortment of revenue stamps.

——The photograph promised for our last, up to the present time has not made its appearance. The only apology we can offer is that it has been inconvenient for the gentlemen upon whom we relied to produce it.

——Subscribers who have not received the index and title to Vol. VI., will find it with the present issue.

Minor Correspondence.

C. J. B., of O.—"I wish to know how many grains of chloride a gold dollar will make. On page 454, Vol. VI., Wm. Craig wishes to know the cause of 'pin-holes,' and as I have not seen his question answered, I will say, for the benefit of those who do not know it, that a gutta percha dipper will cause 'pin-holes.' I hear a great deal of complaint of the blistering of Albumen Paper, and among others Carl Meinerth, on page 431, Vol. VI., of your Journal. It has been about two years since I commenced the study and practice of Photography, and within that time I have not seen a blistered sheet of paper; but, as I am only a tyro, I will not say that 'with common sense and care' it may easily be prevented, though perhaps, *if we supply the 'care,'* Carl Meinerth will be so kind as to impart a little of his '*common sense*' to those who have not yet learned the secret of producing good pictures with a weaker solution than an eighty grain bath." .... Pure gold will make twice its weight of chloride Gold coin is alloyed with about one-twelfth of copper and silver. Weigh the coin, subtract one-twelfth and double the remainder for the amount of chloride. We do not accurately remember the weight of a gold dollar.

D. W. H., of Mich.—"Is there not some way in the art of filtering by which impure or old cistern water or well water might be filtered for general use in the dark room? Of course you perceive I do not mean small quantities for mixing bath and other chemicals, but a large filter for purifying all the water used for washing purposes. Would a barrel filled with gravel and charcoal make a good filter and improve the water, or how could a good filter be constructed? I have thought that I could plainly trace some of my troubles to poor water for washing purposes, and I wish to remedy the evil if I can." .... A filter ordinarily removes only the matter held in suspension in water; if the water is not clear, filtration will make it so, but will not remove saline matters A filter of charcoal, however, will remove coloring and odorous matter, and would be needful for muddy cistern water. in which rats for example had been drowned. But the virtue of the charcoal is soon gone. You should have no difficulty in constructing a filter. Get a sound whiskey barrel, put in first a layer of clean gravel, say six inches deep, then charcoal pulverized a foot deep, and finally fill up with clean white sand. To get rid of injurious saline impurities requires considerable knowledge and experience in chemical operations.

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[NEW SERIES.]

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The Magnesium Light Applied to Photo-Micrography.

BY R. L. MADDOX, M.D.

The successful employment of the combustion of magnesium wire for illumination in portraiture and lantern exhibitions has induced me, at the earliest opportunity, to test its use in photo-micrography. Herewith I beg to enclose for your inspection and remarks (if you deem them requisite) two prints from the same object, the leaf insect of the sycamore,—the negative of one taken by sunlight illumination with Sollitt's condenser, the other by the light from burning 1¼ inch of magnesium wire in the flame of a small spirit lamp and an ordinary condenser.

The details are as follows :—Yesterday, June 16th, I received from Mr. How, 2, Foster Lane, some of the wire. It was very late in the evening before I had time to try it with my usual helio-camera apparatus. Having removed the prism, I placed a small paraffine lamp so as to illuminate the object, condensing the rays by the small crossed condenser of Smith, Beck and Beck's microscope. After obtaining a careful focus on the screen with the two-thirds objective, the exact distance of the centre of the flame from the condenser and the base board was noted. The two-thirds objective used was corrected by a back lens for union of the actinic and visual foci. A *small* lighted spirit-lamp was then arranged to replace the paraffine lamp. The image on the screen was now scarcely visible. A prepared wet collodion plate was put into the frame, the piece of wire held by one end in a pair of pliers, the shutter opened, the shade between the condenser and object removed, and the wire instantly placed, somewhat obliquely, for one-fifth its length in the flame of the spirit-lamp. It soon ignited, emitting a brilliant light, and was advanced as equally as the hand could regulate according to the rate of consumption. It gave out many scintillations, and on reaching the point of the iron nippers, finished by a smart explosion (possibly the ends of the pliers were damp). The wire lasted but a few seconds. Portions of the wire (three-eighths to half-an-inch) were left unburnt.

Under considerable doubt and some excitement (for it was the first time of seeing the wire ignited) I proceeded to develope the image. Unfortunately, in my hurry, the iron solution was shaken, so that the deposit has occasioned some pin-holes. Soon the image appeared equally and of fair sharpness. The development was continued for full detail—perhaps rather too much so. After well washing, the plate was cleared with cyanide of potassium, washed well, flushed with a weak iodo-iodide of potassium solution, rewashed, then strengthened by pyrogallic acid with acetic acid and the citro-silver silver solution. The image appeared slightly fogged by the too long use of the iron solution.

The process was thrice repeated, using the same lengths of wire, but no detail was obtained. Having to leave the room, the apparatus had to be shifted. Possibly in these trials the exact spot for combustion of the wire in relation to the centre of the condenser was not attained. No reflector was employed.

The result you have, and you will, I trust, agree that sufficient has been done to promise more under arrangements less hastily made.

The sun-lighted negative had less than two seconds' exposure. In the prints from artificially-lighted objects there is much softness; the objects appear more solid or rounder than when condensed sunlight has been used to obtain the negative.

The paraffine lamp, with same apparatus, gave an image on five minutes' exposure that had considerable detail—still not sufficient to intensify upon.

[On examining the beautiful photographs above referred to, that difference which seems always to exist between meta-photographs of the same minute object produced by natural and by artificial light is very apparent. The sunlight picture is defined with the utmost perfection in its minutest outlines, drawn as it were with a blunted crayon, somewhat similar to the effect produced by a photograph slightly out of focus. We are assured, however, that the necessary focal preliminaries were carefully attended to. In a conversation with Dr. Maddox, we suggested that the effect produced by the artificial light was probably owing to the distance between the actinic and visual foci of the objective being affected differently by the two methods of illumination, and therefore that the law which holds good with respect to the position of an achromatised objective, so as to obtain the best actinic effect, might not be the same in both cases. We are confident, from some spectra experiments, that such a difference, although it may be minute, actually does now exist; and, if we recollect rightly, M. Claudet many years ago called attention to a fact which he had observed in the working of the ordinary photographic compound lens, viz., that even in daylight the distance between the visual and actinic focus varied considerable at different periods of the same day. Dr. Maddox is of the same opinion as ourselves; but he thinks that other causes intervene to produce the effect of indistinctness of outline in mega-photographs of minute objects by artificial light. He grounds his belief on the fact that. let the lens be moved to any position we please, within or without the visual focus, such photographs always present, more or less, the same characteristics, viz., outlines ill defined, but at the same time pleasing to many from the softness of their general effect. The parallelism of the sun's rays and the non-parallelism of those from the artificial light, could scarcely at first thought be supposed to affect the result, because both have to pass through the same condenser and are reflected by the same mirror before falling on the object; but may not the rays diverging from a point, as in the artificial light, falling on the condenser at different angles, and therefore irregularly concentrated, be sufficient to account, at least in part, for the phenomenon? Dr. Maddox further observes that the colors of the objects photographed are often very dtfferently rendered by the two sources of illumination.

The whole subject is very curious and interesting, and worthy of a fuller investigation than it has yet received. We are aware that Professor Piazzi Smyth has been making some investigations in this direction, but we do not know exactly their nature.—Eds. *Brit. Journ.*

Some New Facts in Relation to the Sunbeam.

The boundless extent of physical science is forcibly illustrated in the study of the sunbeam. What could seem more simple at first than a ray of light? And yet it would require long study to learn all that has been ascertained in relation to it.

First was Newton's discovery that the white ray may be split into seven brilliant and beautiful colors. Then it was found that the ray was a compound of three elements, light, heat, and the actinic rays—those which produce the changes in the photograph, and effect all actions of the sunbeam. Finally, within these few years has come the great discovery that the light produced by burning different substances is not only different in appearance, but, when spectra are formed by passing these different kinds of light through a triangular prism, the spectrum of each element is crossed by lines peculiar to itself. Consequently, however far light may travel, it bears in its constitution the evidence of its origin, and thus brings to us from the sun and from the stars a knowledge of the substances which are glowing in those distant bodies.

Each of the three elements of the sunbeam, light, heat, and the actinic rays, has been subjected to a great number of minute and delicate observations, and many curious facts have been learned in relation to each. Among other things, it has been found that some substances which allow light to pass freely through them are almost wholly impervious to heat.

Professor W. A. Miller, the author of the great work on chemistry which we noticed in a late number, has recently been engaged in ascertaining a similar series of facts in relation to the actinic rays. He finds that the same law applies to these; bodies which possess an equal power of transmitting the luminous rays vary very much in their power of transmitting the chemical rays. This is an important fact in photography, as it is desirable to have the lenses of photographic cameras constructed of substances that will transmit a large proportion of the actinic rays.

Of all the substances examined by Professsor Miller, none was found to surpass rock crystal in diactinic power. Water, ice and white fluor-spar rival it, and pure rock-salt approaches it very closely. None the different varieties of glass transmit rays extending beyond one-fifth or one-sixth the range afforded by quartz. A plate of glass less than $\frac{1}{100}$th of an inch in thickness cuts off these rays almost as completely as a plate of twenty times the thickness. The vapor of water transmits the actinic rays freely, although it is extremely impervious to those of heat. Of the liquids examined, water is most diactinic, and next in order, alcohol.—*Scientific American.*

Ivory Paper.

(A Hint for Carbon Proof Mounts.)

Ivory, from the fineness of its grain, is much used by miniature painters, and photographs on ivory are produced of great beauty, capable of being tinted and slightly colored with much brilliancy and clearness of effect; but it is a very costly article, and only to be procured in pieces of limited dimensions.

Ivory paper is easily prepared in either large or small sheets, and from its hard and even surface, great clearness, and whiteness of ground, will be found peculiarly adapted for the reception and brilliant rendering of subjects with delicate and minute outlines.

To Prepare the Paper.—Take two ounces of clear parchment cuttings, and place them in a pan with a quart of soft water; simmer gently for four or five hours, adding water from time to time to supply the loss by evaporation; then strain through a clean cloth, and when cold it will form a jelly or size No. 1. Now return the dregs into the pan, add another quart of water, and boil as before for about three hours; then strain off and make size No. 2.

Take three sheets of cartridge paper, damp them on both sides with a sponge that has been dipped in soft water, and then paste them together with size No. 2. While they are still wet, place them on a slab of smooth slate, somewhat smaller than the sheets of the paper, turn up the edges all round, paste them on the back of the slate, and allow all to dry gradually.

Wrap a small slab of slate in a piece of No. 2 or 3 sand-paper, and with this rubber make the surface of the paper even and smooth. Now take some of the size No. 1, melt with a gentle heat, and stir into it a couple of table-spoonfuls of fine plaster of Paris. When the mixture is completed, pour it on the paper, and distribute evenly over the surface with a sponge or brush. Allow it to dry slowly, then rub with fine sand-paper. Lastly, take a table-spoonful of size No. 1, and three spoonfuls of water, mix with a gentle heat, and when the mass has so cooled as to be in a semi-gelatinous state, spread a portion of it on the paper, and when the whole has become thoroughly dry, give it an ivory surface by rubbing over lightly with fine glass-paper or Dutch rushes.

Tablets of any thickness can be prepared by increasing, the number of sheets of paper in the early part of the process. The mixture of other pigments with the plaster of Paris will give a variety of tints and tones, and very probably, as a final mount to carbon prints, will materially heighten their brilliancy and effect.

Photographers could, by procuring some of the graduated tinted board from an artists' colorman, and mounting a carbon print on the same, try the effect with little trouble and small cost.

An Old Hand.

—*Brit. Journ.*

Hints On the Use of Stops.

A perfect knowledge of the operation of stops or diaphragms in photographic lenses, and an apt judgment in putting that knowledge into use, constitute one of the most important qualifications of a successful photographer : the subject is, nevertheless, one upon which the most limited, if not also the most erroneous, ideas prevail amongst a very large number of photographers. We propose here to state a few facts, and offer a few practical hints on the subject, without entering into the optical considerations upon which it is based—questions which, if entered into fully without a certain acquaintance with optical matters on the part of the reader, might tend to confuse, rather than enlighten the unscientific student.

Stops are always used as corrective of some defect or shortcoming*; and it may be stated broadly, that they perform two distinct functions. By their position they affect the incidence of the pencils of light upon the lens, and thus modify the shape or character of the image, as regards distortion; and by the diameter of their aperture they regulate the size of the pencils of light, and thus modify the character of the definition.

THE SINGLE-VIEW LENS.—Let us consider first the *position of the stop.*

In the ordinary single-view lens, which is either of plano-convex or slightly meniscus form, its plane or concave surface placed frontwise, the stop is, of course, always placed in front of the lens, and the character of the image is materially modified by the distance at which the stop is placed from the anterior surface. A somewhat unsatisfactory rule has at times been stated as an approximate guide in placing the stop, to the effect that it should occupy a position in front equal to the diameter of the lens; but as lenses of the same focus vary considerably in diameter, a more satisfactory rule is based rather on the focus of the lens than its diameter, and it may be stated generally that the balance of advantages in regard to the view lens, as commonly made, is found in placing the stop at a distance in front of about one-fifth of the focus of the lens: thus in a stereo lens of five inches focus the position of the stop would be one inch from the interior surface of the lens.

The approach of the stop nearer to the lens increases the area of illumination, it increases the barrel-shaped distortion, increases the curvature of field, and renders the marginal definition less perfect, the last defect being a natural result of the preceding one. By increasing the circle of illumination, it will be seen that it permits a larger angle of subject to be included in the picture, provided the scene is one in which the defects involved are unimportant. In interiors, for instance, the subjects are generally such as are improved, rather than injured, by the curved field, and the upright lines being rendered straighter, a balance of advantages is gained by the stop being placed a little nearer the lens. Sometimes also, in street-scenes, lane-scenes, and some landscapes, especially where the subject will admit of vignetting, so as to gain the effect of wide angle and conceal imperfect marginal definition, by the gradation of tint in the edges. On the other hand, where a moderately flat field is important, and where it is important to secure good definition throughout, a loss, rather than a gain, results from removing the stop nearer to the lens.

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* This short-coming may not be a defect *per se*, but an incapacity to fulfill all he requirements of pictorial art in photography.

Removing the stop further from the lens, decreases the field of illumination, flattens the field, improves the marginal definition, tends to equalize the illumination all over the field, but slightly increases the distortion or curvature of lines. Where uniform and good definition is more important than a wide angle, and where a flat field is imperative, as in copying, the removal of the stop to a due distance from the lens will give the best result. Probably, as a general rule, it will be found that the stop should never approach nearer to the lens, as usually made, than one-sixth of the focal length, or be removed further from it than one-fourth.

The Size of the Aperture chiefly affects the character of the definition. The full aperture of a view lens cannot be used in producing a photograph. From the imperfect correction due to the necessary form and position of the lens, the definition of the image and curvature of the field would be intolerable. In proportion as the marginal rays are cut off, and the pencil of light attenuated by the reduction of the aperture, the definition is improved, both in quality and depth. A very little reflection, even by the unscientific reader, will render this apparent. The more acute the angle formed by the cone of rays passing through the lens, the more attenuated and prolonged its point will be, and the more delicate the definition, not merely on one plane, but through several planes, and thus *depth of focus*, as well as crisp definition, are secured. To use a physical illustration, the large aperture gives a result like a lead pencil with a blunt broad point, with which it is impossible to produce a fine line, whilst the small stop brings the pencil to a fine point, and permits of the finest and most delicate delineation.

But there are limits to the advantage gained by reducing the size of the stop. In the first place, the loss of light and consequent prolongation of exposure are in the direct ratio of the reduction of the aperture. The rapidity of a lens depends mainly upon its angular aperture, or the relation of the aperture to the focus. The larger the aperture and the shorter the focus, other things being equal, the more rapid will be the action; and the smaller the aperture the longer will be the exposure. An aperture or stop of half an inch diameter admits only one-fourth the amount of light admitted by a stop of one inch diameter, and will require an exposure of four times long. A stop of a quarter of an inch diameter only admits one-sixteenth of the light which a stop of one inch admits, and will require sixteen times as long exposure as the one inch stop; one-eighth of an inch sixty-four times longer, and so on, the increase of the exposure being in direct ratio to decrease of the aperture. In practice there are at times circumstances of photogenic action which very slightly modify these relations of time to aperture, but not sufficiently to affect the general question. Reduction in the amount of light, moreover, not only prolongs the time of exposure, but frequently renders it difficult to obtain sufficient intensity of the image.

Besides the loss of light consequent upon using a very small stop, there is another evil which is too frequently lost sight of. When the aperture is reduced to a minimum, there is a considerable loss of relief in the image. If the aperture of a microscope objective be reduced too much, there is a loss of separation as it is termed. With the photographic lens stopped down unduly, there is a loss of vigor, relief, separation of parts, and effect of distance. The picture is distinguished by what an artist would term *adhesiveness :* everything is compressed together and dwindled, and a general map-like effect is produced, instead of a picture having relief and distance. Thus, whilst the stop is valuable in improving definition as definition, it is destructive of artistic qualities, if reduced beyond what is absolutely necessary in securing a certain amount of sharpness. The small stop improves definition; the large stop gives relief, and the happy medium must be attained by preserving a due relation between the size of the stop, the focus of the lens, and the character of the subject. For a reproduction or flat surface, where no relief exists in the subject, and fine definition is required, there need be no limits to the size of the stop, except those imposed by loss of light and the danger of aberration from diffraction; but for objects in relief, judgment must be used to secure a balance of advantages.

Stating the question generally, the largest stop which should be used with view lenses of short focus, say of from four inches focus to ten inches focus, should not exceed from one-tenth to one-fifteenth of their focal length; whilst, for the larger single lenses, which are generally less perfectly corrected than smaller ones, the aperture should not exceed one-twentieth of their focal length. The aperture should be reduced beyond this, in many cases, and to such degree as circumstances will reduce it so much as to render the view flat, adhesive, and insignificant.

Depth of Focus, or the sufficient definition of objects on several planes of distances, is only secured by the use of small stops. But it should be remembered that all objects, beyond a certain plane and thence to inffinity, are sufficiently defined. It is only the different planes near to the lens which are palpably out of focus at any time. It has been calculated that with an aperture of one-fortieth of the focal length, all objects beyond four feet from the lens would be in focus, with a lens of one inch focus; and so on, reckoning four feet for every inch of focus. Thus, with a lens of five inches focus and one-eighth inch stop, all objects beyond twenty feet and thence to infinity, would be in sufficient focus. With a larger aperture, the distance beyond which everything would be in focus would be a little greater. But it will be seen, that where rapid or instantaneous exposures are required, sufficient depth of focus can be secured by using care not to include very near foreground objects, but to focus for an object at a distance of something more than four times the number of feet, which the focus of the lens is in inches.

In focussing, the use of a very small stop sometimes diminishes the amount of illumination so seriously, that it is difficult to see whether the utmost possible sharpness has been obtained. On the other hand, if the image be focussed with a large aperture, and a smaller stop then substituted for the large one, another risk is incurred. At first sight, it might be argued, that as the use of a smaller stop always improves definition, it would be quite safe to get the image as sharp as possible with a large stop, and then reduce the aperture still more. This is true to a certain extent; but it also happens that the use of a smaller stop has the effect of lengthening the focus a little, and thus throwing the image a little further from the lens, so that if the focus were taken with full aperture, and a very small stop then introduced, much of the advantage of improved definition would be rendered nugatory. Perhaps the best plan is to focus with the smallest aperture which admits sufficient light to render that operation certain, and then if necessary, substitute smaller stop which will not make perceptible difference in lengthening the focus.—*Photo. News.*

The Microscope.

Brush a little of the fuzz from the wing of a dead butterfly, and let it fall upon a piece of glass. It will be seen on the glass a fine golden dust. Slide the glass under the microscope, and each particle of the dust will reveal itself a perfect symmetrical feather.

Give your right arm a slight prick so as to draw a small drop of blood; mix the blood with a drop of vinegar and water, and place it upon the glass slide under the microscope. You will discover that the red matter of the blood is formed of innumerable globules or discs, which, though so small as to be separately invisible to the naked eye, appear under the microscope each larger than the letter "o" of this print.

Take a drop of water from a stagnant pool or ditch, or sluggish brook, dipping it from among the green vegatable matter on the surface. On holding the water to the light, it will look a little milky, but, on placing the smallest drop under the microscope, you will find it swarming with hundreds of strange animals that are swimming about with the greatest vivacity. Those animalcules exist in such multitudes that any efforts to conceive of their numbers bewilder the imagination.

The invisible universe of created beings is the most wonderful of all the revelations of the microscope. During the greater part of man's existance on the earth, while he has been fighting, taming, and studying the lower animals which were visible to the sight, he has been surrounded by those other multitudes of the earth's inhabitants, without any suspicion of their existence! In endless variety of form and structure, they are bustling through their active lives, pursuing their prey, defending their persons, waging their wars, multiplying their species, and ending their careers, countless hosts at each tick of the clock passing out of existence, and making way for new hosts that follow in endless succession. What other fields of creation may yet, by some inconceivable methods, be revealed to our knowledge!—*Philada. Item.*

Mechanical Drawing versus Photography.

THE London *Engineer* laments over the decline of the art of mechanical drawing in England. We make the following extract from its article on this subject :—

"There are several reasons for the notorious decline in the standard of mechanical drawing. One is the spread of photography, with which, in many things, the best draftsman could never compete. Take the headstock of self-acting mule. A photographer will have it down in no time, while to produce the same picture bp direct delineation might, even with a draftsman of the greatest skill, occupy months. Yet the camera can never fully take the place of the drawing pen and brush. Sharp and hard as the photographed picture may be, it does not show parts obscured in deep shadows. This is a merit, not a fault. It is a merit that the photograph is true to nature, so far as the eye can be trusted, and it cannot be in nature to show more than the eye can see. But the draftsman's art goes away behind anything which Pre-Raphaelism would keep out of view, and it brings up to the front, and that too, in a pleasing fashion, details, which even a Chinese, who will paint the feathers upon the wing of a bird half a mile off, would be content to leave out of sight altogether.

"Therefore, we shall be sorry to see all good mechanical drawing given up to the 'professors' of the collodion process and the elephantine camera screen. Photography is, nevertheless, rendering a great service to practical art, and a great service, too, to the engineer. It is becoming common to duplicate, and, indeed, to multiply, *ad infinitum*, tracings of machinery by means of the photograph. The scale may be kept the same, or it may be enlarged or reduced. We have, for some time, known engine factories where only photographic copies of drawings are sent in to the workmen. Now, for anything that will serve to annihilate that wretched department of labor known as 'tracing' we shall be profoundly grateful, and we will invoke blessings upon Niepce and Mr. Fox Talbot in proportion as this annihilation is hastened. We ought to have commenced this article by saying that 'tracing' is a diabolical invention for destroying draftsmen during the process of their incubation. It must be a very sound egg that can survive a long course of tracing. A month of it will generally chill the energy and dash the aspirations of the most promising pupil, while a year of it is perdition. Seriously, the present practice of tracing does more to blunt the perceptions and break down the taste of those who might else have become not only good draftsmen, but clever designers—more, we say, than would the study of a blacksmith's chalk sketches on his pattern board, for these have vigor and homely truth as well as purpose, and even a master hand could hardly draw them twice alike."—*American Artisan.*

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Major Correspondence.

Carl Meinerth to *C. J. B.*, *of Ohio.*

In the "Minor Correspondence" of the last number of this Jovrnol, you say :— "I hear a great deal of complaint of the blistering of albumen paper, and among others, Carl Meinerth, on page 431, Vol. VI., of your Journal. It has been about two years since I commenced the study and practice of photography, and within that time I have not seen a blistered sheet of paper; but as I am only a tyro, I will not say that 'with common sense and care' it may easily be prevented; though perhaps, *if we supply the 'care,'* Carl Meinerth will be so kind as to impart a little of his '*common sense*' to those who have not yet learned the secret of producing good pictures with a weaker solution than an eighty-grain bath."

The *Editor* having answered your other inquiry about gold, but left the above untouched, I feel as if honored with a call for a reply to you, and it affords me a great pleasure to do so herewith. I would not bother the Editor with inserting this, my reply, if in the first place, all the readers of the Journal had not been made to read your letter with my name in it; and secondly, if I knew your address and could reply to you directly. As it is, I must employ the same mutual channel, and solicit the *Editor's* room and patience.

First, about *blistering.* I did not complain about blistering, in my article on page 431; in fact, I have long ceased to complain of or feel disappointed by any such ugly meteors in the photographic sky; on the contrary, they always inspire me for investigation of their origin or cause—not to *inquire* about of others, but to find out myself. Herein lies the charm for me. And after I have found out, I am happy to give the result to others, not by high mathematical and chemical formulas, which plain readers cannot always comprehend, but in the plainest language for all *subscribers.*

Now back to the subject. In my letter on blistering, on page 431, is a serious misprint : in the second line of the third paragraph it is printed " thirty" instead of *sixty.* I discovered it when I received the number, but supposed all common sense readers would see it, though they of course cannot be expected to guess at the correct number; yet I did not care to trouble the publisher with the request for correcting. Such mischief of the "devil" (the printer's, of course) are not unfrequent at all, rather *too* frequent of late in photographic and other art journals, just where proof-reading *ought to be* a most important duty. To the scientific reader, they are nothing, generally nothing more than any single letter put in wrong or upside down in a common word; but to the common subscriber, ah! quite a *puzzle* (translate it : *head-itch,* and scratch away)!

If it was this mis-print which induced friend J. B. O. to make the gentle remark of " common care" , well, well! I will gladly take it upon me from the shoulders of the printer.

Now read my letter on page 431, and make the correction; see if there was any *complaint* in it about blistering, or any want of *common care.*

Now, finally, as to "imparting a little of my 'common sense' about using a less than eighty-grain bath." No photographic printer, I presume, *now-a-days* dissolves his ounce of silver in less than eight ounces of water. I take more water, and will "impart" my method to my Ohio friend, with a real *down-east sea-breeze delight.* I dissolve one of nitrate of silver (it matters nothing if it costs one dollar or three) in twelve (12) ounces of pure water. Filtering it, of course, every time before floating the paper (two minutes) upon it; and I use this bath until the paper touches the dish. This brings it down to perhaps less than twenty grains strength. Yet, the last silvered are not a bit worse than the first papers, (*exempl gratia,* see the proofs which I enclose for you, Mr. C. J. B., to the Editor). When the papers are dry, I throw them into a drawer, on the bottom of which are a few sheets of filter paper, the undermost of which is saturated with ammonia; after ten minutes they are ready for printing. Fuse two toning baths—the acetate bath for prints which are just right, and the lime bath for those which are over-printed.

But, *but,* but! let me tell you, my dear little Ohio "Tyro of two years old," it is of no use, no use at all, I can tell ye! you may use a 120, or 20 grain bath, and you may tone with fifteen grains or one-half a grain of gold to the ounce of water: it-is-of-no-use-whatever—if your NEGATIVE is not perfect. Truly your friend in art.

CARL MEINERTH.

Researches on Positive Printing.—Where the Silver Goes.

BY MM. DAVANNE AND GIRARD.

The photographer, when he has succeeded in preparing positive pictures, permanent in color and agreeable in aspect, has, nevertheless, not overcome all the difficulties inseparable from his art: an important problem still remains to be solved by him; his beautiful and permanent proofs must be obtained under the most economical conditions.

Sensitized upon the silver bath, each sheet of paper removes a considerable quantity of the precious metal; exposed, toned, and fixed, they retain only an insignificant proportion; almost the whole of the silver compound is dissolved in the different re-agents employed in its production, and, according to the technical phrase, it is thrown among the residues. It is upon the treatment of these residues, and the extraction of the riches they contain, that the economy of photography, like every other industrial occupation must depend.

We propose to explain the course which, in our opinion, ought to be adopted to arrive at this end, and we shall first occupy ourselves by determining with exactitude the important value of photographic residues.

In the course of these researches we have established by direct analysis that each sheet of paper measuring 17×22, when floated on the sensitizing bath, removes from it, partly in the state of nitrate, and partly in the state of chloride and albuminate of silver, a quantity of silver which averages $2\cdot\frac{300}{1000}$ grammes, or 37 grains, nearly. A preparation on a large scale has enabled us to verify exactly the proportion indicated by analysis. We have seen in fact, that the preparation of 419 large sheets measuring 17×22, removed from the sensitizing baths $1\cdot\frac{588}{1000}$ kilogrammes of nitrate of silver; a quantity which corresponds to $2\cdot\frac{400}{10000}$ grammes of silver per sheet. This concordance of results is very striking.

On the other hand, when we compared toned proofs with non-toned, we established that upon a large albumenized sheet similar to those just spoken of, and deeply colored over its entire surface in consequence of long exposure to the solar rays, the quantity of silver remaining on the sheet after fixing averaged 0·150 gramme (about two grains*). If we apply to these proofs covered all over, the rule, that in an ordinary proof, the total of the whites is equal to the total of the darks, we perceive that the quantity of silver constituting an ordinary proof, upon a large sheet of paper, must be equal on an average to the half of the amount above estabished, that is to say, to 0·075 gramme (above one grain). Upon comparing this figure with the 2·400 grammes of silver which the proof removes from the sensitizing bath, we arrive at this conclusion, that the silver forming the picture represents about 3 per cent. of the metal employed, and that the 97 other parts dissolved by the various agents employed in the positive operations go to the residues, and very often into the sewer.

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* Eight experiments gave the following results :—0·170; 0·137; 0·111; 0·172; 0·112; 0·110; 0·154; 0·121 gramme.

The immense extension of the photographic art, during the last few years, has given to these residues a greater value than had been supposed. It would be difficult to determine the total quantity of silver introduced into photographic operating rooms, precise data are wanting on this head; but according to official documents furnished to one of us at the Universal Exhibition, at London, there will be no exaggeration in fixing, for the fabrication of Paris alone, a total of several millions of francs. Of this sum 3 per cent. only is turned to profitable account, 97 per cent. being lost beyond redemption, and without profit to any one, if the photographer neglects to save his residues and extract the metal from them.

For the photographer who follows the usual method in his operations, the liquid and sold substances in which silver accumulates are numerous, and none of them, at least *à priori*, should be neglected.

When the silver bath is exhausted, the dishes and other vessels are washed; these washings must not be neglected. They may be added to the residues, but it will be better to add them to the nitrate bath direct, and make them serve for fresh sensitizings.

When the sheets of sensitized paper are hung up to dry, we place at the lower corner a slip of bibulous paper. These slips should be carefully collected, for they are saturated with strong nitrate of silver.

On removal from the printing frame, each sheet is washed in water to remove the free nitrate; from this source proceeds the most important residue.

Then comes the hyposulphite bath employed for fixing, and the washing waters of the fixed proof.

To these must be added the clippings of the proofs after they are removed from the printing frame, the filtering papers, the kaolin employed for clearing the discolorod bath, and, lastly, the various papers which have been employed to soak up spilled nitrate solution.

The silver is distributed in a very unequal manner among these various substances. This distribution possesses a very great importance in connection with the operations, and we have studied it carefully.

The two following analyses show in what proportion the silver is found distributed by the various manipulations necessitated by the preparation of the positive proofs.

First Analysis.—18 grains, $\frac{80}{100}$ of silver served for the preparation of 14 half sheets; the silver has been afterwards sought for and weighed in the various residues of the manipulations.

	Weight of silver.	Quantity of silver, per cent.
Draining papers................	0·225	1·196
First and second washing waters before toning............	10·170	54·090
Bath of hyposulphite of soda after fixing..............	7·016	37·310
Washing waters of the fixed proofs...................	0·130	0·696
Cuttings from the proofs after printing.................	0·300	1·595
Remaining upon the proofs......	0·582	3·100
Loss, by draining, &c.	0·377	2·013
	18·800	100·000

Second Analysis.—43$\frac{76}{100}$ grains of silver served for the preparation of 14 half sheets; the silver was afterwards weighed as follows :—

	Weight of silver.	Quantity of silver, per cent.
Draining papers................	0·450	1·028
First and second washing waters before toning............	23·132	52·860
Bath of hyposulphite of soda after fixing..............	14·078	32·100
Washing waters of the fixed proofs...................	1·800	4·110
Cuttings from the proofs after printing.................	2·000	4·570

Remaining upon the proofs......	1·356	3·100
Loss, by draining, &c.	0·943	2·232
	43·760	100·000

The two analyses of which we give the results show that the silver employed in the preparation of positive proofs is found distributed as follows :—

About 3 per 100 is found in the finished proof.

About 9 per 100 figure in the solid state in the draining papers, filters, cuttings, and the papers employed to soak up spilled silver solutions, and corresponding to the 2 per cent. loss represented in the two tables given above.

From 50 or 55 per 100 are dissolved in the state of nitrate in the waters, in which the printed proof is washed.

From 30 to 35 per 100 are contained in the fixing bath of hyposulphite of soda.

About 5 per 100, at the most, can be recovered from washing waters of the fixed proofs.

The necessary manipulations for extracting from these various residues the silver they contain, must satisfy three conditions : they must be rapid, economical, and of the greatest simplicity; we hope to succeed in placing them in these three conditions, and to make of the treatment of residues an operation so easy that it may be undertaken by any photographer the least skilled in chemical operations.—*Photo. News.*

The Printing Bath.

Observing some discussion in the English photographic journals as to the proper strength of the printing nitrate of silver bath, I determined to test the subject for my own satisfaction; for, if twenty-five grains of nitrate of silver be sufficient to give good and brilliant prints, why go on using an eighty-grain bath ?

The result of my trial has been exactly what might have been anticipated : equally good prints may be obtained from any strength varying between twenty-five grains and eighty, but only from one class of negative has the varying testimony been inflicted upon the suffering photographic public. A rushes into print, announcing to the world that strong baths are a snare and a delusion, and sends to the editor specimens (and very good ones they are) of prints taken on a twenty-five grain solution. Hundreds of amateurs, delighted at the prospect of saving so much silver, either dilute down their old solution, or, making fresh ones, try the plan, and failing more or less, after toning a worthless batch of prints, calling A a humbug, go back with a sigh to the old formula.

It happens that negatives are brilliant, strong in the lights, and give prints perhaps a shade too hard: here the weak solution answers admirably. By using it A gets better pictures from his negatives than he ever got before, and lauds his discovery. B, knowing nothing of the style of negative A has been printing from, finds his prints wretched, weak, mealy things, which will not tone, and nearly fade out in the hypo. bath. B's negatives are thin, full of detail, print through rapidly, and require the full strength of the eighty-grain bath, if not a stronger one, to bring out all their beauty.

No. 1.

Nitrate of silver	80 grs.
Water	1 oz.

No. 2,

Nitrate of silver	35 grs.

Add liquor ammonia until the precipitate first formed is re-dissolved —then add nitric acid until there is a faint acid reaction.

Water	1 oz.

No. 3.

Nitrate of silver	25 grs.
Nitrate of soda	60 "
Water	1 oz.

Six negatives were used of varying degrees of density, one print being taken off each with paper prepared on the above solutions, in all eighteen prints.

The prints from the strongest negatives were about equal, and after toning could hardly be distingushed; not so with those taken from the thinner and weaker ones. No. 1 bath gave good prints from all. No. 2 were presentable, except from the weakest of all. But No. 3 bath only gave prints worth keeping from the two strongest negatives. All were strictly printed in the shade.

We here obtain a clue to the very conflicting evidence on this point and discover that, to get the best possible print from a negative, some attention should be paid to its nature and the strength of the bath relatively proportioned.

All the above is uearly the A B C of photography, but still this little memorandum may be of use to puzzled and despairing amateurs, to whom as a rule I would advise sticking to an old sixty-grain bath, or, if the negatives are very weak, increase it to ninety or one hundred even. J. J. G.

—*Bengal Photo. Journ.*

On the Conduct of Photographic Controversy.

In empiric sciences, among which we have every right to include photography, there should be no *authorities* Let every one who feels able to examine for himself do so, before taking anything for granted. They alone, however, should do this who proceed to their researches with skill and circumspection, and who are willing to publish the results of their labors with the utmost veracity. If they cannot do this, it were better they did nothing; for, instead of enlightening and rectifying errors, they would only cause perpetual confusion. The reading photographer who was not a scientific man himself would finish by wondering whom he was to believe; and annoyed with the chaos, would throw aside all photographic controversy and research. Periodical photographic literature would also suffer; for, like the mill-horse, one would be continually returning to the same spot by a path of research that had been gone over time after time before.

Therefore let each one who has inclination and ability, examine and rectify the labors of those who have previously worked in the same field; but with care, not superficially. Let him not accuse his predecessor of incorrect statements, until he has himself gone step by step through precisely the same experiment.

And there are peculiar difficulties to be overcome in testing photographic opinions, not to speak of theories. The temple of photographic science is so new, and so far from completion, that every step in it must be taken with caution, lest the foot should stumble and injury be done to oneself and others—*Photo. Archiv.*

A Colorless Varnish.

There are few things in photography that gives the professional and amateur followers of the art more trouble than varnish; and as lac—a resinous substance, the product of an insect found on several different trees in the East Indies—is one of the principal ingredients used, it has ever been a great desideratum among artists, to render shellac colorless, as, with the exception of its dark brown hue, it possesses all the properties essential to a good spirit varnish in a higher degree than any other known resin. A premium of a gold medal, or thirty guineas, was offered some years ago by the Society of Arts for "a varnish made from shell or seed lac, equally hard and fit for use in the arts." There were two candidates, Field and Luning. When on due examination and trial both processes were found to answer the purpose, the Society awarded the sum of twenty guineas to each of the candidates. We give the process known as

Lcning's Colorless Narnish.—Dissolve two ounces ond a-half of shellac in a pint of rectified spirits of wine, boil for a few minutes with five ounces of well-burnt and recently-heated animal charcoal. A small portion of the solution should then be filtered, and if not colorless, more charcoal must be added. When all color is removed, press the liquor through a piece of *silk*, and afterwards filter through fine blotting-paper. This kind of varnish should be used in a room at least 60° Fah., perfectly free irom dust. It dries in a few minutes, and is not liable afterwards to chill or bloom. It is particularly applicable to drawings and prints that have been sized, and may be advantageously used upon oil paintings which are thorougely hard, and dry, as it brings out the colors with the purest effect. Tnis quality prevents it from obscuring gilding, and renders it a valuable varnish for all kinds of leather, as it does not yield to the warmth of the hand and resists damp, which subjects leather to mildew. Its useful applications are very numerous, indeed to all the purposes of the best hard-spirit varnishes.

A common lac varnish may be made by digesting four ounces of clear-grained lac in a pint of spirits of wine in a wide-mouthed bottle, keeping it in a warm place for two or three days, and occasionally shaking it. When dissolved, strain through flannel into another bottle for use—*Brit. Journ.*

Editorial Department.

———The metal magnesium has now been known for upwards of half a century. Its discoverer observed that it burns with a bright light, a fact which in the absence of any trial might easily have been predicted from the nature of its products of combustion. The magnesium light so much talked about is therefore no novelty; some one has however recently observed that wire is the most convenient form in which to have the metal for burning, and this clever observation has brought the light into great notoriety.

The burning of magnesium wire is a very pretty and instructive chemical experiment; it is very interesting to see a silver white metal ignite and burn vividly a lamp flame. In our opinion, magnesium has not been feund to possess any other practicable virtue.

If magnesium were as cheap as lead, it might, under some circumstances, rival gas, or rock oil, as an illuminating material, and were it as cheap as silver, and at the same time could produce the brilliant magnesium light which some enthusiastic persons have seen, it might be useful for some photographic purposes, as a rival to the lime light. But the plain fact is that the intensity and brilliancy of this light have been enormously exaggerated. The light from a magnesium wire burnt in a spirit lamp flame, is not greater and perhaps not more intense than a good coal oil lamp will give, and it is not at all comparable with the lime light. But our enthusiastic English friends tell us that photographs have been made by it, and that it has extraordinary actinic properties. In the winter of 1840-41, a daguerreotype was made at night before a large audience, by means of the lime light, and since that time similar experiments have been, at least in America, a common lecture room illustration. We have made an ambrotype by the light of coal oil lamps, and it is a common thing to produce transparencies by gaslight. To believe the English journals, one Moule has been for years making photographs at night with a kind of gunpowder &c., &c. This magnesium light is surely a case of "great cry and little wool."

———The formation of photographic societies seems to be the fashion of the day; there are now fully organised at least six societies in the United States. We wish for all these a long and happy life. But it is to be observed that the immediate and temporary business interest is the chief bond of union, and it is much to be feared that some of them will have the unhappy fate of predecessors.

Minor Correspondence.

T. J. S., of Ill.—"Do you know of a reliable process for the solar camera, more sensitive than the ammonia-nitrate, or the albumen processes?" ....The development processes are more sensitive.

J. G. T., of Mich.—"Is there any valid patent on the manner of taking these 'gem' ferrotypes for cards, on the principle of a movable slide and a number on one plate? ....The validity of the patent has not been determined by a court. Who can say how judges and juries will decide; the uncertainty of the law you know is proverbial.

H. S., of Md —"Your difficulty in the tannin process seems to be only the non-adhesion of the film to the glass. The failure to stick is chargeable to the collodion on the glass or bath. If the gun-cotton of the collodion be of the contractile sort, or if the plate be cleaned with acid, and the acid not removed with an alkali, the film is pretty sure to come off. The preventions are evident. The remedy is a preliminary coating of the glass with a solution of rubber or albumen. When the tendency to peel off is not very great a varnishing of the edges is sufficient.

J. T. B, of Ind.—"The streaks in J. G.V.'s bath (p. 24) are caused by an excess of alcohol, I think, which should be evaporated out, by boiling it down, say at least one-half. I have found this an excellent remedy in all such diseases of the bath; afterwards diluting it with ice water. It improves a bath very materially to boil it at least once a week, in warm weather, an iron kettle lined with porcelain, is an indispensable utensil in a photographic gallery.

D. W. W., of Wis.—We think it very unlikely that there is any merit in Swan's invention for producing a sort of stereoscopic effect. If the effect were curious the expense and trouble incident to his arrangement would make it impracticable.

L. E. H., of Mich.—Cedar Swamp is a new name to us for a photographic disease. The print you send does not appear to us to be a very decided example of any disorder. Patches of streakiness are often occasioned by the final rubbing of the cloth when cleaning, and especially in damp weather. Streaks generally are in the direction of flow of the collodion or of the dipping.

R. L. N., of Conn.—Those yellowish blotches on your print indicate that the print was not fixed. When a print is fixed, it appears on looking through it uniformly semi-transparent. A little longer in the hyposulphite, and you are all right.

W. M., of D. C.—"Can something be substituted for alcohol, which is very dear now, for drying positives and evaporating solutions? will hydrogen answer the purpose? Can you tell me why the same collodion, bath, developer, light, and everything the same that about two weeks ago would make an ambrotype in from four to six seconds, takes now from twelve to twenty-five? ....Ordinary illuminating gas answers admirably, when burned from a Bunsen burner. The burner should be connected with the fixtures by a rubber tube. When gas cannot be had, rock oil should answer, when properly burned. Hydrogen would be impracticable. ..We can not account for the loss of sensitiveness. The collodion bath, &c., surely could not have been in the same condition. Like causes produce like effects, is an axiom recognised since the time of Adam,

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On Cleanliness in Photographic Operations.

One of the first lessons to be learned by the student of chemistry when he enters a labratory—if he has not already learned it in his more private experiments and manipulations—is the absolute necessity of habits of order, conjoined with a circumspect regard to cleanliness in all parts of his work. If this lesson is not learned, if the natural disposition or domestic education of the pupil has unfitted him from being systematically clean and orderly, it may be considered a settled matter that he will never become a good chemist, and had better turn his attention to some other pursuit.

"Mr. Jones," said Professor T———, in whose laboratory we commenced our chemical practice—addressing a fellow-student who had then been in the laboratory about six weeks—"Mr. Jones I have already spoken to you several times about your having left your apparatus unwashed and unarranged upon the table when your work for the day is over, instead of carefully cleaning it and placing each article in its proper place. This morning I see it has occurred again." Jones was about to make some apology, but the Professor cut him short by saying—"Mr. Jones, I should be doing you an injury by keeping you in my laboratory any longer. Nature does not intend you for a chemist; you will do better in some other profession. Go, Mr. Jones, go." We were young when this happened, and we thought the old Professor was much too severe on poor Jones; but as we now look back, instructed by experience, we are more and more persuaded that the Professor was entirely in the right.

If all amateur and professional photographers could have had the benefit of even a short course of chemical study in a well-conducted laboratory, we are confident that we would not think it needful to write this article; but, unfortunately, a large proportion of those who practise photography have not had this advantage. They have been engaged in other pursuits, probably, and have merely taken hold of photography as an amusement, or as an enterprise of a commercial character promising pecuniary profit; and hence they oftentimes lack some very necessary qualifications for a successful prosecution of that branch of popular science called photography. To be sure this evil has some compensations. Photography has thus enlisted not a few original minds, untrammelled by the prejudices of a systematic education, ready to try what is apparently absurd or impossible, abounding in novel expedients and unexpected resources, and sometimes succeeding where other men would certainly have failed. But, while we recognise this fact, we still lament that so many persons engaged in photographic pursuits have not had the advantage of a more systematic training, as, on the whole, we are well convinced that much more is thus lost than is gained by the incidental advantages to which we have alluded.

The practice of photography requires much patience, demands system and order, is subject under the most favorable circumstancex, to vexations, mishaps, and disappointments, and at times fails in some way, which baffles the most experienced in their efforts to discover why. But if the workman be one who habitually disregards some of the primary rules on which success in a great measure depends, is it a matter for surprise that he finds photography still more uncertain, vexatious, disappointing and expensive?

We are well convinced that we are here touching upon the reason why some of our photographic friends have lost faith in the working of certain processes; why some abuse without stint the manufacturers of their materials; why some are out of humor with their lenses or their cameras; why some succeed to-day, but fail all the rest of the week; and, to end the catalogue, why some give up the whole matter in disgust, and pack away everything in the lumber-room, or sell out at a ridiculously small price.

To show that we are justified in regarding disorder and dirt as prolific sources of photographic trouble and failure, it may be well to adduce some examples of it which have fallen under our observation. We have seen all the solutions made with water untested, but which, after repeated failure had taken place, being tested, was found to contain a very large per centage of organic matter. We have been forced to remonstrate against the practice of cleaning only one side of the glass used for the sensitive plate. We have seen dirty fingers used to stir photographic prints while being washed preparatory to toning, the same fingers immediately afterwards alternately dipped in the toning-bath; cyanide of potassium broken by the hands, and used in a culpably careless manner, and various other chemicals carried in the palm of the hand from one part to another; lenses obscured by a thick coating of dust, or streaked by the touch of greasy fingers; albumenised paper handled in much the same manner one would handle a newspaper; and many other things of a similar character. As a result of such careless and slovenly practices we have seen a large number of very poor photographic pictures, for causes are always followed by their legitimate effects.

We would, then, most earnestly impress upon the minds of our readers the importance of a strict regard to cleanliness in all their photographic operations, if they would reduce to their proper proportions the causes of failure in their work. And we would especially recommend this to all who are just making their first attempts at photography; because if they begin carelessly they will probably go on carelessly, and will undoubtedly find the road to photographic progress, which might have been tolerably easy and pleasant and which would have led to success, difficult and uncertain, and leading at last to disappointment.—*Brit. Journ.*

About Smoking and Photography.

As a number of persons have an idea that tobacco smoke exercises an injurious influence upon sensitive surfaces, let us converse a few minutes on the subject, and inquire—Is it possible for an inveterate smoker to be a good photographer?

Who among us dry-plate photographers is there who has not been repeatedly asked by his friend and brother amateur to come and spend an evening? "I have got some plates exposed, which we can develope; and some excellent tobacco and Glenlivet," Tobacco and dry-plate development seem part and parcel of each other. I can, in fancy, see our friend Nicol prepare for this photographic operation. The yellow shade being duly adjusted over the lamp, a cloud is seen to flit over his usually placid face; and in answer to the momentuous question—" Have you forgotten to bring some pyrogallic acid with you?" we are informed that it is a more serious affair than that: "he cannot find his pipe!" This important matter being speedily remedied, clouds are blown, the plate-box and chemicals are produced, and the latent images lurking on the surfaces of the plates are speedily made to appear.

It is sometimes asked—has tobacco smoke no deleterious influence on a delicate sensitive surface like that of a cellodionised plate? Any one who has been in the interior of friend Galloway's developing-room, at the close of a fine summer's day, will have no difficulty in answering the question in the negative. Galloway is an expert manipulator, and a highly-successful dry-plate man, as the portfolios of his friends can testify. I am not aware if he ever tried the effect of developing a plate without the assistance of his pipe; but I do know that some of his finest pictures have been ushered into visual existence in the presence of smoke so dense that the direct light of the sun might almost have been admitted into the chamber with impunity. In answer to a question once put to him by me, as to whether he could anticipate any ill effects from the presence of such huge volumes of tobacco smoke, he replied—" Why yes! the smoke might be so dense as to prevent me even *seeing* the plate, and that would be a serious matter; but otherwise I don't know of any inconvenience."

In order to test this question as far as possible, I recently generated dense fumes of tobacco smoke in a box in which were placed two of Dr. Hill Norris's plates—one exposed, the other not. These were compared with two others which had not undergone such fumigation. It was not possible to distinguish between them. The inference, then, is that, in moderation at least, tobacco smoke has no ill effects upon sensitive glass plates. The experiment was varied by having several large tufts of flax, previously saturated with nicotine oil, placed moderately near a sensitive plate which had, half an hour previously, been exposed for a transparency. The result must be equally gratifying to smokers—there was no apparent deterioration.

The case is very far from being properly stated, if the following question be not discussed:—Seeing that tobacco-smoke has no appreciably ill effect, can it be said to have in any sense a good effect? In reply, what, it may be asked, is the great secret in the development of dry plates? Is it not to avoid all undue haste, and literally to spend plenty of time over the operation?—It is a matter of the utmost importance that there be no forcing on of the development, by substituting copious doses of nitrate of silver solution for the weaker solution applied for a little longer time, by which latter means is brought out a picture full of soft details instead of a thing of patchy hardness, with well-marked snowy effects all over the trees and grass—the usual effect of a too rapid development. A nervous, excitable, impatient individual will be apt to commit this error; but let such an one, before he commences to apply his pyrogallic acid solution, insert his meerschaum, or "short clay" into his mouth, and the soothing, grateful and sedative influences of the weed—the dreamy state of calm repose engendered by it—destroy all tendencies to impatience, and render him perfectly indifferent as to whether his plate takes *two* or *twenty* minutes for its proper development. He has for the time got another occupation, in virtue of which he can afford to wait with all needful patience.

There are of course two sides to every question; and some people have been at pains to warn us—

"How they who use fusees,
All grow, by slow degrees,
Brainless as Chimpanzees,
Meagre as lizards;
Go mad, and beat their wives;
Plunge, after shocking lives,
Razors and carving knives
Into their gizzards.

Confound such knavish tricks!
Yet know I five or six
Smokers who freely mix
  Still with their neighbors;
Jones—(who, I'm glad to say,
Asked leave of Mrs. J.)—
Daily absorbs a clay
  After his labors.

Cats may have had their goose
Cooked by tobacco juice;
Still why deny its use
  Thoughtfully taken?
We're not as tabbies are;
Smith, take a cigar!
Jones, the tobacco jar!
  Here's to thee, Bacon."

As this jotting is intended to be rather suggestive rather than exhaustive, I now leave the *Nicotiana tabaccum*, which, by the way, belongs to a suspicious family—that of the order *Solanaceœ.—Brit. Journ.*

"Brummagem" Photographs.

On the 3rd of November, 1863, there was a large muster of the members of the Photographic Society of London; met, as the President, the Lord Chief Baron, said, "to examine a most interesting subject, and to listen to the history of *those photographs of an early period* which Mr. Smith had rescued from oblivion."

From the evening in November last, when Mr. Smith, who has charge of the Patent Museum, exhibited to the Photographic Society some pictures, supposed by him and others, to be *sun-pictures*, executed at Soho, Birmingham, by either Boulton or Watt, about the year 1780, there has been much and some angry, discussion on the subject.

Having carefully preserved all that has been printed in connexion with this discussion, having heard much that has been said, and having examined the alleged photographs, we feel ourselves in a position to place the case before our readers, and to place the case before our readers, and to state the conclusion at which we have arrived.

The pictures are of two characters: some on paper, two on metal plates. They were discovered by Mr. Smith, who was at the Soho Works, Birmingham, "on business connected with the obtaining Watt's first engine for exhibition at the Museum of Patents." Mr. Price, an agent for the Boulton family, brought some of those pictures to the notice of Mr. Smith, who confesses to have been deeply interested in, as he thought, the discovery of photographs of a much earlier date than any with which we are acqnainted. Mr. Price exhibited, under the stimulants supplied by Mr. Smith, much zeal in the discovery of pictures, and of circumstances connected with them which added to their interest. Stripped of much adventitious matter, the story of these productions took the following form :—

Mr. Eginton, about 1780, worked in connexion with Mr. Boulton some secret process by which he could produce "pictures from any painting," and secure "copies on paper, copper, canvas, &c." Mr. Price informs Mr. Smith that "this transfer appears to have been in what was termed, in the documents he had found, 'dead colors,'" When thus produced they were frequently finished as oil-paintings, water color drawings, &c., and passed into the hands of Mr. Barney to color.

These pictures on paper, and those on metal, were stated to have been discovered amongst "a mass of paper taken out of Mr. Boulton's library seventeen or twenty years ago; and *at that time the library had not been opened for fifty years.*

It should be stated here, that although Scheele, in 1777, published his discovery of the action of the solar rays on nitrate of silver and on the dissimilar powers of the different colored rays in effecting this change, it was not until 1802 that any attempt, as far as we know, was made to render this discovery available for producing pictures. At that time Mr. Thomas Wedgewood published in the Journal of the Royal Institution, "An Account of a Methed of Copying Paintings upon Glass, and of making profiles by the Agency of Light upon Nitrate of Silver, with Observations by H. Davy." That paper proves that Thomas Wedgwood produced photographs upon glass, on paper, and on leather, "by direct solar light." It proves also that he used the camera-obscura, but found the images formed "to be too faint to produce, in any moderate time, an effect upon the nitrate of silver." Davy states that he copied the images produced by means of the solar microscope "without difficulty on prepared paper."

Much ingenuity is evident in the endeavors made by Mr. Price to show that probably a Society, known as the *Lunar Society*, which sometimes met at Soho House, numbering Boulton, Watt, Priestley, Williem Herschel, Joseph Banks, Benjamin Franklin, and Mr. Josiah Wedgwood among its members, had much to do in the production of those pictures. There is not, however, the faintest trace of evidence to prove the pictures *on paper*, in Mr. Smith's possession, are examples of the results of Eginton's process, whatever that may have been. These pictures are called, in documents left by Eginton and Boulton, "Mechanical Paiatings." There appears to have been an exhibition in the Strand, in 1778, of "Polygraphic Pictures," by Mr. Joseph Booth, and these are supposed to have been of the same description as those prepared at Soho. This may or may not have been the case.

The question is, how were the pictures, prepared by Eginton and sold by Boulton, produced? Mr. Smith, relying on Mr. Price, who brings forward the evidence of the existence of a camera-obscura in Soho House, and tells of "a dark tent and nothing but a picture on the table," rushes to the conclusion that they are *sun-pictures* (photographs)—proving thus, as he supposes, the discovery and practice of photography twenty years before the date of Thomas Wedgwood's paper.

Those pictures—we confine our attention, at present, to those on paper—are copies from oil paintings, or from prints. They are produced by juxtaposition, or by some process of transfer, which gives the reverse position to all parts. The figures are wrong as regards right and left. The pictures are generally of a peculiar umber-color, resembling, in many respects, the tone often produced by the decomposition of the salts of silver. So far they look like photographs. If they had been copies from oil paintings, by means of the camera-obscura, there would have been inequalities in them, which do not exist. This would naturally arise fromthe variations of chemical power in the radiations from surfaces of different colors.

If copied by photography from engravings, the engraving would be traceable. There are no indications of any.

The coloring matter of these pictures produces no stain, no dye, upon the paper; it is easily rubbed off from the surface. In a copy from a picture by Angelica Kauffman *one figure has been omitted.* These things point to a mechanical process, and are certainly adverse to the conclusions of the production of those pictures by a photographic one.

Much stress has been laid on what appears to have been the fact, that albumen was used, and that fine weather was desirable in the preparation of the "mechanical pictures." The albumen was evidently employed to prevent the color from sinking into the paper, and therefore are we enabled to remove it *entirely* by rubbing the paper with a damp finger. The fine weather was probably necessary to dry the varnish colors used on the albumen.

Mr. D. P. W. Boulton, the grandson of Mr. Watt's partner, has, with great care, examined all the evidence which has been brought forward, and the results of that examination are given to the public in four pamphlets. From the last of these, we select a few paragraphs, from letters written by Eginton, and for Boulton and Fothergill, in 1781-2, which completely settle the question against Photography :—

"I have herewith sent the pictur of Penelopy *upon glass,* upon the terms I mentioned to you. Pleas to inform Mr. B. that when I have the originale pictur to coppy, they will be better."—*From Eginton to Hodges, March,* 1782.

"In reply to your favor to our Mr. Boulton, we have to acquaint you that our *mechanical method* of taking copies of pictures does not injure the original, any more than the engraving of a plate does the piece from whence it is engraven; and, further, that the expense of making the necessary apparatus for the copying of two portraits would be in the same proportion as the engraving of a copper-plate to take off two impressions only; hence you will readily conceive how high two copies would come if we were to execute them.—*Boulton and Co., to Mr. Garnett, March,* 13, 1781.

"We have to say that our mechanical method of doing them is such that we cannot make 'em of different sizes without being at a similar expense as the engraving of a plate to take off only two impressions."—*Boulton and Co., to Messrs. Clark and Green, July* 16, 1781.

Mr. M. P. W. Boulton remarks, "In various articles in journals it has been inferred that the polygraphic copies must have been produced by some photographic process, because they are spoken of in old *documents* as 'sun-pictures,' but I cannot find that such is the case. * * I have seen nothing showing that they were called 'sun-pictures' in contemporary documents, or by the persons who are actually concerned in their production."

The pictures *on paper* are, therefore, certainly not photographs. It is equally certain that the two pictures on metal plates are photographs. Were they produced by Boulton or Eginton, or by any other person, at the date assigned to them, viz., about 1791? One of these photographs has been, unfortunately, very nearly obliterated by a photographer to whom it was intrusted for, if possible, restoration. The remaining one is said to preserve a view of Soho House, "before the alterations, which were made previous to 1791."

These pictures may be Daguerreotypes, or they may be examples of M. Niepce's Heliographic process, but, if the former, they would date no further back than 1839; if the latter, they would have been produced between 1814 and 1828. We are told at first, on the authority of Price, that those plates were found with the "mechanical pictures" in Mr. Boulton's private library seventeen or twenty years ago, "and at that time the library had not been opened for about fifty years." Mr. M. P. W. Boulton replies to this in his first pamphlet: "This representation," he says, "of the case is by no means accurate. The library in question was not hermetically sealed. The room itself was in constant use, and the books freely accessible.

Much has been said respecting a camera-obscura which was known to have been in existence in Soho House, and to have been used by some members of the family. Admitting this, it does not advance the inquiry in the slightest degree. At the end of the last century, the camera-obscura was very commonly employed by artists and amateurs, for copying landscapes and buildings; and Thomas Wedgwood certainly made experiments with a camera-obscura before 1802. All the evidence given by Price is rendered valueless by the following statement made by Mr. P. W. Boulton, in his 'Remarks': "Concerning Price, I have found that he has been guilty of great dishonesty, having fraudulently appropriated a large sum of money. In his letters to me he has confessed that, for many years, he has abused the confidence reposed in him. * * It is obvious that, if I suppressed such circumstances, and allowed his testimony to enjoy the credit due to that of an upright person, I should myself be doing great wrong to the public, and to those who are now considered the inventors of photography." Mr. Boulton continues : " With reference to the subject of the camera, I find that there were *two* cameras in the library at Soho : a camera-obscura and a camera-lucida. Both were frequently used by Miss Wilkinson. She used the camera-obscura for photography properly so called (*i. e.*, for making pictures by means of a lens), but she used it far more frequently for making copies of objects by drawing." Miss Wilkinson is said to have known nothing of photography before the publication of the discoveries of Daguerre and Talbot, and the pictures on the metal plates are so like the first productions of an amateur, that we need not in all probability, look further back than the time when this lady was studying photography. Mr. M. P. W. Boulton says, "I find that the portion of the library in question, called the back library (the room in which the camera, photographs, &c., were found), was used by Miss Wilkinson as her studio."

It is now proved that the photograph alleged to be a representation of Soho House before the alteration, is not so. The photograph shows a house of two stories, and old Soho House was, according to the evidence of Mrs. Townshend and Samuel Vale, three stories high. It is then suggested, that it may be a picture of Holker House, near Carke, in Lancashire, with which Eginton was at one time connected, and the evidence of Miss Stockdale is brought forward in support of this. Mr. Boulton gives a lithographed view of Holker House, together with a sketch from the photograph, and a restoration of Soho House therefrom. It would be incorrect to say there was no resemblance between the two; but it would not be difficult to pick out many houses in the Midland Counties, of any one of which the indistinct photograph might be considered as a copy."

The conclusion at which we arrive, from a most careful examination of the entire question is, that the received history of photographic discovery is not in the slightest degree disturbed by the "mechanical pictures," or the photographs, found at Soho, Birmingham.—*Athenœum.*

A Colorless Varnish.

I HAVE already stated [*ante* page 70,] that at the time the process of varnish-making by Luning was laid before the Society of Arts, Mr. Field put in a claim, when both the processes and products were found to answer the intended purpose, and the claimants were awarded twenty guineas each.

Mr. Field describes his process as follows :—Six ounces of shellac, coarsely powdered, are to be dissolved by gentle heat in a pint of spirits of wine; to this is to be added a bleaching liquor made by dissolving carbonate of potash, and then impregnating it with chlorine gas till the silica precipitates, and the solution becomes slightly colored. Of this bleaching liquor add one or two ounces to the spirituous solution of lac, and stir the whole well together. Effervescence takes place. When this ceases add more of the bleaching liquor, and thus proceed till the color of the mixture has become pale. A second bleaching liquor is now to be added, made by diluting muriatic acid with thrice its bulk of water, and dropping into it pulverised red lead, till the last added portions do not become white. Of this *acid* bleaching liquor small quantities at a time are to be added to the half-bleached lac solution, allowing the effervescence which takes place on each addition to cease before a fresh portion is poured in. This is to be continued until the lac, now white, separates from the liquor. The supernatant fluid is now to be poured away, the lac well washed in repeated waters, and finally wrung as dry as possible in a cloth.

The lac obtained by the foregoing process is to be dissolved in a pint of alcohol, more or less, according to the required strength of the varnish; and after standing for some time in a gentle heat, the clear liquor—which is the varnish—is to be poured off from the sediment.

When the processes of Luning and Field came before the Society of Arts, the Editor of the *Franklin Journal* (Philadelphia) made known the process of Dr. Hare, in which he stated that "all the objects sought for were speedily attained, and left nothing to desire, save on the score of economy."

The following was Dr. Hare's process :—Dissolve in an iron kettle one part of pearl ash in about eight parts of water, add one part of seed or shellac, and heat the whole to ebullition. When the lac is dissolved, cool the solution, and impregnate it with chlorine till the lac is all precipitated. The precipitate is white, but its color is deepened by washing and consolidation. Dissolve in alcohol. Lac bleached by this process yields a varnish as free from color as any copal. AN OLD HAND.

—*Brit. Journ.*

On the Preparation of Alkaline Bromides.

BY M. KLEIN.

BROMIDES of metals of the first section being most used in photography, the author has endeavored to find a way of preparing them more expeditious than those generally adopted, and it occurred to him to apply a process M. Liebig employs for producing alkaline iodides.

Bromide of Calcium.—Mix one part of finely powdered amorphous phosphorous with thirty or forty parts of water in a capsule placed under the basket-funnel, and gradually add 12·5 parts of bromine. The mixture is effected with disengagement of light, and the liquid becomes heated; then shake it and add the bromine until the mixture begins to decolorise. When all the bromine has been used, heat in a sand bath; and when all the color has disappeared, add sufficient bromated water to impart a yellow tinge to the solution. Then decant immediately and neutralise by a slight excess of lime. Filter, wash, and evaporate. The excess of lime carbonates in the meanwhile, which necessitates a second filtration, after which evaporation in a water bath completes the operation. With sixteen grains of amorphous phosphorus, 200 grains of bromine, and about seventy-five grains of quicklime, the author obtained 230 grains of bromide of calcium. Bromides of barium and strontium may be prepared in the same way.

Bromide of Magnesium.—Neutralise with magnesia the acid liquid obtained by attacking one part of phosphorus by 12·5 parts of bromine in presence of water. After filtering, evaporate in a water bath, and dry over sulphuric acid.

To Obtain Bromide of Lithium.—Decompose bromide of calcium by carbonate of lithia, used, at first in insufficient quantities. Leave to digest for twenty-four hours, after which finish the precipitation by carbonate of lithia. Bromides of potassium and sodium the author obtains by a process previously described for iodides (*Journal de Pharmacie et de Chemie*, xli., 520); that is to say, by the decomposition of bromide of cadmium by means of sulphate of potash or soda.—*Journ. de Pharmacie et de Chemie.*

Formulæ for Negative Solutions and for Positive Printing.

BY E. SCHERING.

COLLODION.

Pyroxyline	100 grains.
Alcohol (sp. gr. 0·815)	10¼ fl. oz.
Ether (sp. gr. 0·715 to 0·730)	10¼ "
Iodide of ammonium	80 grains.
Bromide of cadmium	35 "
Iodide of cadmium	25 "

It is indispensable that the gun-cotton should, before use, be several times washed—first in hot distilled water, and subsequently in alcohol—since it is a preparation of extreme instability, and, after being kept but a short time, liberates oxide of nitrogen, which acidifies the cotton with nitric acid. Gun-cotton which, on drying, yields a horny film on the plate so much confines the molecules of iodide of silver that the developing agents have difficulty in reaching them. A collodion prepared from such cotton is extremely insensitive, and for this reason it is not at all available for portraiture: whilst it is, on the other hand, preferable for negatives of engravings. Want of sensitiveness in collodion, when the same is but a few days old and only darkened to straw color, may be always traced to the physical and chemical condition of the pyroxyline used in its preparation.

Both ether and alcohol must have the prescribed specific gravity, and they must not have been exposed for any length of time to light. Undue importance is generally attached to their chemical purity. Only the other day I prepared a very excellent portrait collodion, with ether and alcohol, which grievously offended my organ of smell.

SILVER BATH.

One part of re-crystallised nitrate of silver dissolved in ten parts of pure distilled water. The solution is acidified with a few drops of chemically pure nitric acid sufficiently to faintly redden blue litmus paper.

The solution having been put in the bath, a plate as large as possible, coated with iodised collodion, is placed in it, and, having been moved up and down at intervals, is taken out again after five or six hours. The same operation is gone through with a second collodionised plate. If, after the further space of six hours, the bath does not yield a perfectly clear negative a third plate must be placed in it.

Eighty ounces of bath will now give at most forty or forty-five vigorous, clear negatives of the size of three *cartes de visite.* As soon as the film, after the plate is taken out of the bath, begins to assume an opaline appearance, and the image readily turns grey on developing, the bath must be at once placed in a porcelain pan and evaporated to half its volume. The volume may then be made good by adding water; then filter, and go on using again *with perfect confidence,* adding to it small quantities of a ten per cent. silver solution (say five to eight ounces), in order to replace the silver used. Acidifying and saturating with iodide of silver will not be necessary.

Five-sixths of all the undesirable phenomena which occur in the production of photographic negatives are attributable to the amount of ether and alcohol in the bath, and they may be very easily and surely overcome by evaporation. It is a very good plan to have a reserve of several silver baths. I have not made a new bath for nearly two years, and unless some unforeseen calamity should befall my reserve, I shall probably not make another. Much has been said about the evil effects of organic impurities in the bath. The fact is, the bath digests in a short time every kind of organic matter during the evaporation, so here there is no ground for fear. All the time the bath continues to have a faint acid reaction there is no need to be troubled about its organic impurities.

Even experienced operators are occasionally alarmed by the extraordinary phenomena attending the production of a negative image on a dirty plate. Beware of badly-polished glass. If the edges of the negatives, after fixing, do not look perfectly white, the glass plate was not clean.

DEVELOPER.

Protosulphate of iron	1 part.
Glacial acetic acid	½ "
Alcohol	¼ "
Distilled water	30 parts.

RE-DEVELOPER.

Pyrogallic acid	1½ grains.
Acetic acid	20 minims.
Distilled water	1 ounce.

To a quarter-ounce of the above I add about three or four drops of a four per cent. silver solution. The more slowly the negative is intensified so much the more harmony will then be in it. A negative rapidly intensified always loses much of its beauty. With the above solution it would be dfficult to spoil a negative; and even a bad workman might be trusted to intensify with it. A negative treated with it does not abstract more silver than is good for it.

For fixing the negatives use a saturated solution of hyposulphite of soda.

SILVER BATH FOR PAPER PICTURES.

Nitrate of silver	1 part.
Very pure nitrate of soda	2 parts.
Distilled water	20 "

To be placed some hours in the light (sunlight preferred) each time after use, and filtered before using again. This bath must be made up in volume, and again rendered fit for use by the addition of five-eights part of nitrate of silver, as soon as five sheets of albumenised paper have been sensitised on twenty-one ounces of it. It is very advisable to often prepare a new bath : the prints are the more vigorous. If the prints get greyish, either the negatives are weak or the light is too strong. Prints to be fine must be copied slowly.

GOLD BATH.

Pulverised borax..........................	2 drachms.
Water..................................	10 ounces.

Two hours before use add to this solution five grains of not too acid chloride of gold dissolved in one ounce of distilled water.

When used, the bath must be very gently heated from 77° to 88° Fahrenheit. The prints must *not* be allowed to get *quite blue.* If they assume a brownish granular aspect in the gold bath, the cause of this appearance is not to be found in the paper. Pictures copied too rapidly from weak negatives become stained in the gold bath. Normal prints are also liable to get brownish stains if the bath during toning is over-heated, or if it contain more gold than the formula allows.

With this bath I tone every kind of print, including those on arrowroot paper, although for the last-named it should be diluted with an equal body of water.

Albumen prints toned with this bath, without heat, acquire a peculiarly beautiful greyish violet aquatint tone, which I used formerly often to admire in Disderi's photographs.

I would further remark, generally, never search for the faults which present themselves in your negatives and positives in the chemicals or paper, but elsewhere. You will then trace them out quicker, and become acquainted with the history of their development. To the practice of photography many are called but few chosen. It is uncommonly simple and easy to produce, without interruption, any number of good negatives. The whole photographic process is easily comprehensible, and yet how few photographers obtain, without hindrance, continuous good results !—*Brit. Journ.*

On Fogging.

BY M. MC.-A GAUDIN.

Nothing is more annoying in the practice of photography than the occurrence of this untoward phenomenon, which takes place invariably when least expected,especially when using protosulphate of iron as the developing agent. There is scarcely a photographer in existence who has not grumblingly submitted to this disagreeable *contretemps.* I have even known some who, ignorant of other remedies, have set aside the bath until another day, in the hope that things would remedy themselves, so that it is sufficiently obvious that the cause of *accidental* fogging is not yet known. I say accidental fogging to distinguish it from that which necessarily results from the employment of too strong solutions, or from excessive neutrality in the collodion, bath, or developer. The fogging of which I speak is that which occurs in the most unexpected manner when working with substances which are in every respect all that could be desired.

Let us first observe that this fogging occurs principally in warm weather, and so suddenly that one is tempted to attribute it to atmospheric electricity, which, unquestionably, plays an important part therein; and it is on this account that during the warm weather I think it is best to remove all possible chance of its occurrence.

The various substances now in use for producing a negative image are all of a complex nature; and, under the continued influence of an elevated temperature, they necessarily become more perceptibly modified than during winter. It is well known that a new substance has to be formed before they are in working order. Several undefined substances result from the mixture of the salts with collodion, alcohol, and ether, which are distinguished by a discriminating sense of smell. In all probability aldehyde is one of these substances, which so long as there is only a trace, may conduce to increased sensibility, but would have a contrary effect if an excess were to be formed.

I am therefore led to conclude that the cause of accidental fogging in warm weather is found in a species of ethereal fermenation which occurs under the influence of heat, aided by a finely-divided body like collodion, which, in this case, plays the ordinary part of porous bodies, which are known to be powerful aids to chemical combination; and therefore the best remedy will be to isolate the sensitised collodion from its nitrate bath.

This obliges me to repeat that the sensibility of a plate is altogether independent of the presence on that plate of the silver bath, wherewith it was sensitised; that the plate may, in fact, be most completely washed without diminishing its sensibility, provided that before developing the image the plate be re-immersed in the silver bath in such a way as to impregnate the film with nitrate of silver to the same extent that it was before washing. In one word, it is for the development, and not for the reception of the image, that the presence of the silver bath is necessary.

During the warm weather the silver bath on the plate, if inclined at a certain angle, seems to have undergone all sorts of changes. In some places the liquid is much concentrated, corrodes the iodide of silver, and produces an inequality. If the slightest reaction becomes established under this influence, the silver bath so far becomes in an abnormal condition, and is susceptible of decomposition by the developer alone without exposure of the iodide of silver to light. All this may occur without reckoning that the plate moistened all over by nitrate of silver causes a serious loss of the nitrate bath, and serves only to make those long black streaks which often spoil the finest negative.

I would observe, then, that, during warm weather, instead of taking the plate direct from the bath, to the camera frame, it will be best, in order to avoid fogging and stains, to immerse the plate again in a flat or vertical bath filled with distilled water, which need not be renewed until it acquires from four to five per cent. of nitrate of silver.

It will be necessary, however, when using a fresh bath of distilled water, to immerse the plate again in the nitrate bath before developing the image. When the strength in nitrate of silver reaches one or two per cent. this precaution will be unnecessary, more especially as accidental fogging is thus, in all probability, caused by the *extreme concentration* of the silver bath; for if the developer be made to suit a bath of eight per cent. it will naturally cause some irregular result on mixing with a bath which has attained some fifteen, twenty, or twenty-five per cent. in certain parts of the plate, and this irregular action taking place in a small degree in any part of the plate will propagate itself over the whole.

In this way much more freedom from failure will be experienced than when the production of the negative is retarded by an unlooked-for reaction. With a silver bath reduced to two per cent. nothing of the kind need be feared; and I do not see why this method should not be universally employed, since it has been proved that neither the presence or strength of the nitrate bath has any influence on the sensibilty, and that a strong bath adherent to the plate during exposure is an incessant cause of inequality, of stains, and accidental fogging.—*La Lumiere.*

The Brooklyn Photographic Society.

Another society for the promotion of art has been added to the iustitutions of Brooklyn. The photographic art is perhaps not so generally apreciated in America as in France, England and Germany, where it is made the study and entertainment of art-loving and scientific amateurs, yet there is a growing admiration for the art, many amateur photographists are to be found among our own citizens. For those who have the means and leisure to indulge their tastes, photography is a pleasing study, and an entertaining and useful pursuit. The uses of the art have been multiplied, and new discoveries are continually being made, adding an increasing interest to the pursuit.

It is computed that there are, at least, a hundred amateur photographists in Brooklyn, in addition to a larger number of resident professionals, and the idea of forming a photographic association is one that might have occurred some time since, as similar associations have been in flourishing existence for some years past in New York and other cities. The proposition to form a Brooklyn Photographic Association originated in a recent gathering of professionals, for mere business purposes. On the 20th of June, a meeting of proprietors of photographic establishments in this city was held at James's gallery to consider questions of charges, with a view of fixing uniform rates. Successive meetings was held which led to interchanges of views, upon less mercenary topics, and it was resolved to form an association. Meetings for that purpose were held at the different galleries, a plan of organization adopted, and a constitution and code of by-laws prepared.

The first public meeting was held on the evening of July 26th, at the Brooklyn Institute. There were some fifty gentlemen present. Mr. W. E. James occupied the chair. Mr. W. A. Miller officiated as Secretary, and Mr. Chas. A. Williamson, Treasurer. Among those present we noticed many of the leading photographers of Brooklyn, Messrs. Sherman, Morand, Douglass, Harrison, Swanton, and others.

The constitution previously adopted was read again. It provides that the organization shall be known as "The Brooklyn Photographic Society;" its object the elevation of the art of photography, the instruction and amusement of its members, who may be either members of the photographic profession, amateurs, or sincere lovers of the art. The object of the Society more fully explained is to promote a knowledge of the natural laws which govern the action of light; discussion of views upon the processes of the art, the study of effects, the arrangement of figure, and all that appertains to the art. It is proposed to hold meetings twice a month.

Mr. Burgess, chairman of a committee previously appointed to make nominations for officers, reported that the committee had been unable to make up their minds upon a ticket, and thought it would be more satisfactory to select the candidates in open meeting. The committee then asked to be discharged. Agreed to.

Mr. Burgess then moved that the Society proceed to the election of officers.

The election resulted as follows :—

President—Nicholas Pike.
Vice-President—W. E. James.
Recording Secretary—N. G. Burgess.
Treasurer—Aug. Moran.

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——In Eighth Avenue *cartes* are still made for one dollar per dozen. We observed, however, that they were not worth any more.

A New Kind of Funnel.

Mr. Editor—In the early part of last year I broke the only glass funnel I possessed and was unable to procure one in this place, consequently I was compelled to find a substitute, a specimen of which you have in your possession. They may be made of leather dressed or tanned, of cloth new or old, either linen, woolen, or cotton, also of paper in the form "papier mache;" of whichever material they are made they should be thoroughly saturated with shellac dissolved in alcohol and well dried before use. They are then a good substitute for glass, they will not leak, and they will not break. A circle of six inches radius will make the bowl of two funnels each of which will hold one quart. They should be cut directly through the centre. The spout may be made of such length and size as will suit the use for which it is intended. The shape of the bowl is a semi-circle, and can as easily be made single as otherwise. N. Griffing.

Guilford, Conn., Aug. 8th, 1864.

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Mastic Varnish.

Mr. H. Senior in the *News* of July 29th discourses as follows :—

"I have all along been using mastic varnish, one part of the gum to ten of alcohol. I find it to be superior to any of the manufactured varnishes. I have printed in a sun of about 150 Fah., and tried it with three or four of the shop varnishes, and all kept together in the sun, the maximum heat of which was above. When I examined them, I found that all the shop ones had caused the paper to stick and spoil the negative, while the paper on the mastic came off very easily. Ever since that I have used my friend. The only drawback is the risk of chilling while pouring on the varnish; but this is very easily provided against by warming the plate, and coating in a room closed up against all draft, and then warming the plate again immediately after. Now, the other day, by not paying proper attention to this, I coated a plate outside, when a breeze blew and chilled the plate; the mastic was immediately deposited in flakes all over, and I gave up the negative as lost. An amateur friend was with me; I showed him the negative, and asked him if I could not recover the negative by heating it and then pouring on absolute alcohol, which would re-dissolve the precipitate, and then by evaporating the alcohol again by heat, leave the varnish transparent on the glass. He said he thought so. Well, afterwards I resolved to try the experiment, but found I had no absolute alcohol, nor any to be had within a hundred miles; so I thought I would try the mastic varnish itself. So, taking all precautions against another chill, heating the plate, &c., to my delight I got a transparent coating of varnish; the former deposit was re-dissolved, and the negative was recovered. If yon think this to be of any help to photographers, you may dispose of it as you like.

" When I wish to rub out a varnished negative, I put it first in a tray of cold water, and gradually pour on one side boiling water, thus raising the temperature without cracking the glass, this makes the varnish powdery and rub off very easily; then by a little alcohol, and afterwards a little plain collodion, restore the plate to its pristine state."

Editorial Department.

——Too great care will kill a cat, it is said, a very astonishing fact regarding an animal proverbially pertinacious of life. But a similar paradox is now being developed in the career of certain periodicals. A few weeks since the *Round Table* a highly respected literary weekly, looking upon the light for the last time, in view of immediate dissolution, solemnly declared that it perished from its prosperity. and that its publication had come to be too expensive a luxury for the proprietors ; a copy of the paper cost more than was charged for it, and the public demanded more copies than the good-natured publisher could find money for. All men who are connected with the publication business fully appreciate this case.

The proprietors of standard daily papers however have their remedy; they advance the prices. The morning paper is a necessity, and thus their continued existence is secure. The literary and scientific are only a luxury and people dispense with them for the smallest causes.

We get two dollars for a volume of this Jonrnal when we could in good conscience receive four. But we think all our readers would not pay four, and we are unwilling to lose one of them, and so there is still no prospect of a change in the rates of publication.

Notwithstanding the recent advance in the cost of everything we need, the Journal can still pay its expenses; we still buy white paper for a less sum than we charge for the printed sheet. But the plain fact is that the publication is not sufficiently remunerative and, except for confidence in better times in the future and our obligations to the public, we should abandon the post. Something clearly must be done!

We have taken the subject into serious consideration and after a sufficiently protracted deliberation have embodied our wishes and hopes in the following resolution:

Resolved, That the number of subscribers to this Journal be doubled fortwith.

The resolution is passed without a dissenting voice: every reader says Amen.

But now comes the task to execute it. How simple it would be if each subscriber would procure his double! Unfortunately this cannot be the way Some of us must bear the burden of the dozen who, like the foolish virgins invited to the wedding, begin to make excuses. The editor will do his part anyhow.

This increase of our company will make all go smooth again, and we shall be able to forget that last ten per cent. advance in the cost of paper, it will go a great way in preparing for the next, and will postpone indefinitely that evil day when we shall begin to think of giving as little as others do, for what we receive.

——Hail Canada! Among many other handsome things on our table are three numbers of a photographic periodical bearing the title of *The Canadian Journal of Photography*. This new and very welcome friend of our art appears monthly, and subscribers pay annually $1 50 (gold) for it. Maclear & Co., Toronto, are the publishers. A pleasant *confab* with the able editor, Mr. Ewing, assures us that the enterprise is of the most worthy character. Every Canadian photographer should hasten to assist it.

Minor Correspondence.

A TORMENTED PHOTOGRAPHER.—"I live in a mosquito region near New York, and the tormenting little insects cause me to do myself much mischief. They enter my studio in great numbers, and when I attempt to coat a plate with collodion or raise it from the silver bath to place in the holder, they light upon my neck, ears and face. In my sudden attempts to remove them I am apt to adorn my collar, shirt bosom, and face with little beauty spots of nitrate of silver, Now, Mr Editor, take pity on my misfortunes, and tell me how to remove those nitrate stains from linen and oblige?" ....Cyanide of potassium removes silver stains from linen pretty promptly and is commonly used We have an eye on a substance which may prove preferable. ..A friend at our elbow suggests that the fact that mosquitoes whose teeth have been extracted are harmless, may be of use to our suffering friend

C. J. B., of O.—"I have tried the new developer of sulphate of iron and ammonia. It works very well, but no better than the iron developer that I have always used, and just the same exposure in the camera. I mixed the two together in different proportions, and they worked equally well any way they could be mixed. I see *no udvantage* to any but the *manufacturer* of the new salt, To the consumer it is more expensive than protosulphate of iron, therefore it is *a disadvantage.*"

THE AMERICAN
Journal of Photography.
[NEW SERIES.]
VOL. VII. SEPTEMBER 1, 1864. No 5.

How to produce Life-size Photographs.

SOLAR camera Photographs deserve more attention than they have hitherto received. The great fault which artists discover in very large photographs produced direct from life in the ordinary way, by extraordinarily large lenses, is, invariably that of distortion; and looking upon them as portraits, most persons would admit that, while easily recognised, they are yet strangely unlike. Photographers, on the other hand, their eyes being less educated to detect a want of truthfulness in the proportions and contours, prefer large pictures executed with these unusually large lenses, because they render the details and markings with a sharpness precision, and strength wanting in large pictures obtained by a camera printing process from small negatives.

Contrasting two large pictures, the one being obtained by the use of a large lens, and the other by a process of magnifying through a small negative, few artists would fail to award the latter the palm for natural truth and pictorial beauty. In this country the use of the solar camera, as the instrument for obtaining life-sized photographic images is in its infancy; but on the Continent owing chiefly, perhaps, to reasons upon which we shall have presently to touch, it is more popular with the profession, and much more largely used.

For painters the instrument is peculiarly useful, although they have not yet, perhaps recognized the fact. To *pose*, light, and group nude or draped figures, obtain a negative therefrom, and then throw the magnified image from this negative upon the canvas, requires comparatively little time, and many effects may be so obtained and tried, before the artist finally takes his charcoal and goes over the outlines and shadows of the optical image to transfer it rapidly and permanently to his canvas, thus securing a fidelity to Nature, and an accuracy of drawing, which would otherwise be the result of days of laborious work and patient study from living models.*

We propose, in the following short paper, to describe the solar camera, and the process of using it, giving the chemical formula adopted by Mr. Sydney Smith, certainly one of the most successful and perhaps the most experienced solar-camera operators we have.

Life-size photographs were, undoubtedly, produced privately, as early as 1853, by Mr. Wenham† (some say earlier), the process then adopted being that of bringing a magic lantern into use by employing a transparent stereoscopic picture to give the enlargement and using a portrait-combination lens, reversed in position, for an object glass.‡ Despite the fact, however, of attention being thus early called to the practicability of obtaining life-size photographic images, little or nothing further was done until, we believe, about 1858, when an American photographer, of Baltimore, named Woodward, patented what was called the solar camera § which is, in fact, an application of the well-known principle of the solar microscope. Mr. Atkinson, of Liverpool, first introduced the instrument into England in 1859, believing that it had only to be known to be in great demand. Not only did he expect it to be largely used by photographers, but, as he shortly afterwards said, he also expected that "all photographers and painters on canvas or other surfaces would provide themselves with one, and that eventually artists would attach one or two to every suitable window in their houses." Although this gentleman's expectations were not fully realized at the time, it is likely they soon may be, as the instrument is now rapidly rising in repute amongst photographers, and its productions are as rapidly becoming more sought after and appreciated by the general public.

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* Some painters argue against everything that renders their art less difficult in practice as a source of degaation, as if the great merit of a work of art resided, not in the intellect and genius embodied, but in the labor bestowed; not in the effect obtained, but in the means of obtaining it. It may be more difficult to execute a picture in charred wood, with a hot pokerf than to paint one with good pigments and a well-made brush; but who will assert this as a reason why a picture obtained by the latter process is inferior to that by the former?

† A paper on this subject was read by this gentleman at a meeting of the Photographic Society, December 1, 1863, and on the same evening another paper on this subject was read by our friend the late Editor of the *British Journal*, Mr. George Shadbolt.

‡ An acquaintance of ours uses this process, but with artificial light—a lamp indeed—for throwing an image upon his canvas, magic lantern fashion, when by tracing it, he gets the correct outlines, to aid him in his profession as a portrait painter.

§ It was stated in France that Chevalier manufactured solar cameras in 1889; but we believe between these and Mr. Woodward's great dissimilarity exists.

The instrument is very readily and simply described, being little more than an ordinary photographic camera, fitted up in front with a lens of, say 4½ inch focal length, supplied at the back with a small mirror and condenser, and fitted up internally with grooves &c., in which to place the negative, by aid of a small door opening at the side. The camera is used in a darkened room, the back being exposed to the light outside the window through a hole in a shutter, or similar arrangement, and the lens pointed towards a kind of easel on which the canvas, if you intend to trace, or a sheet of paper to form a focussing screen, if you mean to print, has been smoothly and flatly placed. The image of the sun being received on the mirror—moved to the required angle by the provided means—is caught by the condenser and transmitted through the negative and lens on to the focussing-screen, canvas, lithographic stone, photographically sensitized paper, or whatever else may have been prepared for its reception. The mirror must be at an angle which will place its focus exactly on the centre of the enlarging lens.

Upon uncovering the lens the more or less enlarged image will be seen * upon the white screen in the centre of a circle of light

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* The image is, of course, formed by light, the shadows, therefore, white on a dark ground, the effect being similar to that of a chalk drawing on a black board; but such a drawing ! Those only who have seen it can realize its beauty. When the purpose of tracing is all the operation is intended to serve, a transparent glass positive is preferable to an ordinary negative.

being of smaller or larger size, and intensity according to the distance between the screen and the lens of the camera. This circle is surrounded with colored bands formed by the non-achromatic condenser, and upon these the eye must be carefully fixed during the process, as their variations indicate a corresponding variation in the position of the sun, calling for an immediate alteration in the adjustment of the mirror before the process is allowed to proceed. To omit doing this would result in a foggy, indefinite image, wanting in distinctness and definition : the same result, in fact, that moving any object during the process of photographing it in the ordinary way would produce. To aid the eye in detecting any alteration of this kind—in avoiding which the sharpness and clearness of the result is concerned—when the circle is first formed a pin or two is stuck in the paper, on the yellow border of the illuminated field, and these indicate at once any movement on the port of the sun. A piece of yellow glass is also employed, which, being placed behind the negative, allows the image and circle of light to be examined at the same time that, the glass being of course impervious to the actinic rays, all chemical action ceases.

Suppose photographing is your object, the image is focussed with the rackwork of the camera, and, when it is in focus, or perfect, the lens is covered with the cap, or the negative with the yellow glass, and the sensitized paper is put in position. If you adopt the process of developing, a very faintly impressed image only will be required, which can be obtained in about 12 seconds during the summer, and in 40 seconds during the winter; but if you require an image printed right out, as in the ordinary printing process, the exposure will be from one to three or four hours. The first process is the more simple and certain—the last the more hazardous and uncertain; but with reference to results, the latter, perhaps, has the advantage.

We now give the mode of operating, with regard to printing by development, which we regard as the best process.

1. Of the negative required.—This is *all-important*, and a really artistic picture, with transparent shadows and perfect gradations from light to dark, cannot be obtained without a good negative—good, not in the sense in which a negative for ordinary use in the

printing frame is good, but peculiarly in reference to solar camera productions. This negative should be, every part, more or less transparent or thin—it cannot be too thin—and should be a slightly over-exposed negative, such as, in the pressure or printing frame, would give a weak, flat image, without sufficient contrast. From this negative we can get an enlarged picture having the whole of the details and half-tints well registered in the lighted portions, and without that red cast over the burnt-up shadows which indicates over-printtng, or that greenish cast over the imperfectly-registered half-tints, on the lighted portions, indicative of under-printing. For taking this negative on, select a piece of thin, pure, white plate glass, entirely free from flaws, bubbles, scratches, or other defects. Coat it with a bromo-iodized collodion, which should give a smoothly even film, free from either a crapy appearance or other defects arising from floating particles of dust,* and which, although seemingly unimportant, become glaringly conspicuous when magnified. When coated, the plate must be sensitized in a weak silver bath, about 30 grains to the ounce, well exposed in the camera, and developed with sulphate of iron, 15 grains; spirits of wine, 15 drops; and the same quantity of glacial acetic acid. After developing until every scrap of detail is secured, wash, and fix, and dry in the usual way, but do not varnish the plate, as it must be used without undergoing that process.

2. We next come to the paper. We have found none better than Hollingworth's. It is to be kept carefully clean, handled carefully, and salted by immersion in a bath made as follows, in which it should remain until thoroughly saturated :—

Bromide of potassium	7½ grains.
Chloride of ammonium	4½ "
Gelatine	3 "
Water	1 ounce.

It is next sensitized† on a solution of nitrate of silver, 60 grains to each ounce of water, which must be brushed carefully over the surface with a piece of clean Canton cotton.

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* For which reason dust is to be most carefully avoided through the whole of the operations necessary for taking the negtive.

† It is hardly necessary to inform the operator that, once sensitized, the paper must not be again exposed to light, until it receives the image.

3. Our next business is with the exposure to the negative. While yet damp, the paper is fastened *smoothly* and *flatly* on the stretching frame, or rather board, on which the image has been previously focussed, as above explained. The sun being out, and the reflecting mirror properly arranged, the lens may then be uncovered, and the process of exposure commenced. A faint and barely visible impression, such as will be obtained from a tolerably good negative in about 12 or 15 seconds, in the warm summer weather, and in 20 or 40 seconds in winter, will suffice. When the negative is not sufficiently thin, or proportionately transparent in every part, a more strongly printed image is required for development, and the exposure must therefore be lengthened. In the print such a negative is recognized by the reddish color of the deeper shadows and the greenish color of the fainter half-tints.

4. The developing follows next in order of description. Without exposing to daylight (of course), the exposed paper is taken down, and the edges turned up, so as to form a dish, the image being upwards. Into this dish a saturated solution of gallic acid is poured that it sweeps *at once* over the whole surface. To this, it is best, in summer, to add a little acetic acid (a few drops), but in winter it is not necessary. Should any portion of the paper have escaped the silver solution when it was sensitized, red insensitive patches will now reveal them. During development, the deeper shadows darken most rapidly, and the more delicate tints come last. The developer must be kept in continual motion, and for this purpose a tuft of swan's down calico may be used. The process will generally occupy from 15 to 30 minutes, according to the temperature of the room. If the negative has not chanced to be a suitable one, long before the details are all developed or visible on the illuminated side of the image, the shadows will be undergoing a process of destruction (losing their gradations, reflections, and details), and whatever plan you may adopt, an imperfect, inartistic proof must be the result.

5. Fixing. When the image is well developed, the gallic acid is *thoroughly* washed away with a plentiful supply of clean water, care being devoted to the thoroughness of this washing, because,

otherwise, stains will be produced of a very unpleasant character. This done, a solution of hyposulphite of soda, about five ounces to a quart of water, is used to fix the image,* after which it is well washed away, and the operations are complete.

6. Printing without development. In this case the image remains on the printing board for hours, instead of seconds or minutes, and additional care and labor becomes necessary. The mirror requires more attention, the circle of light longer and more careful watching, while there is danger of the image loosing its sharpness and force through the paper beginning to dry, and, therefore, to contract. In this case the exposure is continued until the print is not only out with all the strength and detail the negative can give, but is slightly over-printed. It is then treated just as a print in the ordinary way would be. The best pictures produced in this way are Mr. Stuart's, of Glasgow, whose formula we append :—

TONING BATH †

Acetate of soda	7 ounces.
Distilled water	80 "
Chloride of gold	15 grains.

FIXING BATH.

Hyposulphite of soda	6 ounces.
Water	20 "

7. Printing enlarged negatives. This is the more rapid and certain, but also the most expensive and troublesome of the solar camera's applications. The coating of such huge plates with collodion, and the evenly developing of them being no easy task. The process is to get a transparency on glass from the negatives, and use this in lieu of the latter, so as to obtain a negative, instead of a print, of the required size. This negative can be used in the usual way, in a huge printing frame, and any number of proofs can be readily, cheaply, and easily obtained. The camera, too, may be used at any time, and in the absence of the sun, the

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* The fixing will generally occupy about half an hour

† For this formula we are indebted to Mr. Stuart, the well-known Glasgow photographer, whose solar-camera pictures are so widely admired.

exposure being only one of a few seconds. The electric and oxy-hydrogen light have been successfully used with the solar camera

R. A. S.

—*Art Journal.*

Production of Oxygen Gas.

In a paper read before the Pharmaceutical Society a short time since, Mr. Robbins described a new, scientific, and cheap method of producing oxygen gas. After adverting to the various methods hitherto employed, he says :—

"It will have doubtless, been observed by you that in all the processes hitherto known, a high temperature is necessary, and until that point is reached, no product whatever is obtained; this fact we may consider as the chief difficulty experienced in the preparation of oxygen, and more especially so when sulphuric acid is used. If, for example, by the mere addition of sulphuric acid to bichromate of potash in the cold we could get the same results which are obtained by the application of heat, this process, instead of being thrown in the rear, would have front rank. Oxygennesis therefore stands alone as a novel and the only mode we possess for procuring oxygen without the application of heat. The mode of using this compound is extremely simple. We have only to take some of this powder, place it in a glass flask or bottle provided with an exit tube, pour on either of the dilute mineral acids, and we have immediately oxygen evolved in a similar way, and with as much facility as hydrogen is obtained from zinc, or carbonic acid from a carbonate.

"The composition of this compound is extremely simple, merely a mixture of peroxide of barium and bichromate of potash; not so the chemical changes resulting from the addition of an acid. Peroxide of barium, on addition of sulphuric acid, is resolved into sulphate of baryta and peroxide of hydrogen, and it is from this sometimes so-called oxygenated water, we get this curious and interesting chemical reaction. Whenever peroxide of hydrogen and chromic acid are in contact with each other, instantaneous decomposition is the result; the chromic acid is reduced to sesquioxide of chromium, and the peroxide of hydrogen to water, at the same time pure oxygen derived from both those substances is disengaged. * * * * * We are not compelled to use precisely the ingredients mentioned, but may substitute analagous compounds.

"Peroxide of barium might be replaced by any other peroxide capable of forming binoxide of hydrogen, of which there are several —peroxide of potassium, sodium, strontium, and calcium, but all these at the present time are practically useless, peroxide of barium being the only one that can be easily and cheaply prepared. Bichromate of potash may be substituted by manganate or permanganate of potash, binoxide of manganese, or binoxide of lead; the cost of the two first-mentioned forbids their present use, and the one selected is by far the most preferable to the others. With regard to the acids, either of the mineral class will do, but I prefer sulphuric acid.

"The next question is, in a commercial point of view, a most important one; however much this method may be admired for its simplicity, and the ease with which the operation may be conducted, its ultimate success or failure must depend on the cost. Can the oxygennesis therefore be manufactured and sold at a price sufficiently low to make it an article of commerce? I believe it can be made available for all purposes whenever oxygen is required to the extent of some gallons. One of the ingredients of this compound, peroxide of barium, has never yet been produced and sold as a commercial article, and from the trouble in making a small quantity, but few, even practical chemists, care to prepare it for themselves. It can hardly therefore be expected that a compound of this nature can at once be manufactured and sold at a price it must be ultimately be reduced to, if extensively used and produced in quantity. Five shillings per pound, the price hitherto charged, would, I admit, be a barrier to its general adoption; but I am happy to say we have now made the necessary arrangements to lessen the cost of production, and have at the same time reduced the price to three shillings, for the one pound bottle, and less if a larger quantity is required. Some of the baryta compounds are found abundantly in nature, and are but of small value in the market, but up to the present time but few uses have been made of them; they now promise a much more extensive application. Mr. Kuhlman has perhaps done more than any one else to develop their uses and value in the arts."—*Photo. Notes.*

The Changes of a Piece of Silver.

If we place a piece of pure silver in nitric acid, and add a proper quantity of water, the silver is dissolved as completely as sugar is in water, and wholly disappears; the solution looking exactly like pure water. If now we evaporate a portion, and set the solution away, we shall find in the course of a few hours that the bottom of the vessel is covered with beautiful, white, flat pieces, which are crystals of nitrate of silver, the metallic silver in combination with nitric acid. The nitrate of silver has some very singular properties. If kept free from contact with other substances, it may be exposed to the light for any length of time without any change from its pure white color. Or, it may be applied to cotton, or the skin, or hair, in the dark without any change in color. But if it is applied moist to any vegetable or animal substance and exposed to the light, it turns black in a few minutes. It is the coloring agent in indelible ink. If we place crystals of nitrate of silver in water, they are quickly dissolved, and if we throw a little table salt—the chloride of sodium—into the solution, the silver leaves the nitric acid, and combines with the chlorine in the salt, forming the chloride of silver. This is a white, lustreless powder, and turns black when exposed to the action of the light. Metals may be silvered cold by means of the chloride of silver. If we mix chloride of silver with carbonate of soda, and heat the mixture in a crucible to a very bright red, it is dissolved, and both of the substances are decomposed. The chlorine leaves the silver and combines with the sodium of the soda, forming chloride of sodium—table salt—the carbonic acid escapes as a gas, and the silver is left in the metallic state in the bottom of the crucible. Thus we have silver first as a white solid metal, then a liquid like water, then as a grey or black powder, and finally again as a metal. And these are only a very small part of the forms which it may be made to assume.—*Photo. Notes.*

Improved Backgrounds.

BY THOS. BENNET.

In taking photographic portraits or pictures in which it is desired to adopt suitable backgrounds, foregrounds, or perspectives, it has been hitherto the practice to use a painted canvas descending to, and terminating at the floor or standing place of the apartment or place. Now, according to my invention, I use a canvas, (or equivalent substance) suspended or secured upon a roller or rollers, with pulleys and cords, by by which the canvas (or its equivalent) can be raised or lowered, the said canvas (or equivalent) being always of sufficient length to allow it to be brought down to the floor, then stretched along the same, and kept in position (if desired) by catches or grippers, so that the person or persons, or principle object or objects to be portrayed may stand upon a part of the canvas (or equivalent). The background, foreground, or perspective which is to remain perpendicular, or nearly so, is to be painted or depicted in the ordinary or perspective manner, and that part of the canvas or equivalent which is to lay upon the floor is to be painted so as to have the same concurrent effect as the upright part, and so as imperceptibly to "run into" the same, for which purpose I have hitherto adopted the plan of first painting the upright part, and fitting the same to a corresponding position to that in which the same is intended to be used, and then stretching the horizontal part upon the floor, drawing lines or objects by the aid of the camera.

Having fixed upon a suitable design or picture for the background and foreground, I hang the canvas against the wall, allowing a part of the same as far as desired, to be flat upon the floor, and I paint the perpendicular portion in the ordinary perspective, after which, for a landscape, I paint the floor portion with a full-sized view of whatever is desired to be represented, slanting the "work" in order that it may run into the upright portion, so that any person or object placed upon the floor portion shall form a part of the picture when taken by a photographic process. For "interiors' in painting the horizontal portion, I make use of the camera thus :—I view the upright picture in the camera, and thereby ascertain the angles of its perspective lines, when I depict the lines of the horizontal portion so as to meet the same, the angles of the horizontal portion depending on the distance from the picture at which the photographic apparatus is to be used. When the picture is thus prepared it may be taken by the ordinary photographic apparatus, together with any person or object placed on the floor part and forming one entire picture.

Having now particularly described and ascertained the nature of the said Invention, and in what manner the same is to be performed, I hereby declare that I claim the herein-described improved arrangements for obtaining pictorial backgrounds, and foregrounds and perspectives, when taking photographic portraits and sun-pictures. It being understood that I do not claim the details of constituent parts thereof, except as used in the manner and for the purposes set forth.—*English Patent.*

Restoration of Injured Negatives.

BY JOHN SPILLER, F.C.S.

Your readers may be interested in being informed of a really efficient plan of restoring negatives, the varnished films of which have become honeycombed and partially separated from the glass by the action of frost. A short time since I had occasion to try experiments upon a few negatives, which were injured by the cold and damp during the last winter, and have succeeded, by exposing them to the vapors of alcohol and ether, in causing the uplifted portions to return to their original position on the glass plate. In the present instances it was not even necessary to apply an extra coat of varnish, a precaution which would obviously aid in the preservation of thin and weak films. From the restored negatives we have been able to procure prints in which no sign of the injury sustained has been apparent; it seems impossible to eradicate all traces of the imperfections upon the negative itself, but these do not, however, leave any mark upon the print by which their existence could be discovered.

The mode of working was simply to employ an ordinary glass shade in an inverted position, and having placed therein a mixture of three parts of methylated alcohol and one of ether, the injured negatives were introduced two at a time, and with their coated surfaces outwards, and top covered with a glass plate. At the expiration of about twelve hours the collodion films had completely subsided, and then required merely to be slightly warmed for the purpose of hardening the varnish. It does not appear that any disadvantage ensues as the result of leaving the film exposed to the alcohol vapor for a longer than the period actually sufficient to effect the restoration, and I have never noticed any indication of the settlement of condensed liquid upon the plates, so that the film is not under any circumstances liable to slip or become separated.

Royal Arsenal, Woolwich, Aug. 1864.

The Magnesium Light.

BY M. MC-A. GAUDIN.

If, as seems probable, we succeed in obtaining illumination by magnesium, we shall be indebted for it to photography, for it is the want of obtaining readily, no matter at what cost, a very intense and highly actinic light that has drawn attention to this new and very curious phenomenon, and which has instigated so many efforts to obtain the metal in wire susceptible of being unwound by suitable mechanism in proportion as it becomes consumed. Till within the last few days I could say nothing about the magnesium light, having never seen it, but as soon as the wire was for sale in Paris, I immediately experimented with it.

Magnesium wire is sold in all the principal photographic warehouses of Paris at the very high price of 1,500 francs the kilogramme (or 1½ franc the gramme,) instead of 300 francs, the price advertised in England. At this price it must remain merely an object of curiosity, but it is quite certain that as soon as it is employed in large quantities, the price will fall to 100 francs or less.

As to the source of lighting, it is evident that photography occupies the first rank in incurring expense; and as I am occupied as much as anyone with lighting great distances by means of parabolic reflectors, I see other very numerous applications which will lead to great consumption, tending to a reduction in the price of metal, to the great advantage of photography : I now proceed to develop my ideas on this matter.

This magnesium wire is now sold by weight, of a diameter which varies from $\frac{1}{3}$ of a millimetre to 2 millimetres; it is a metallic wire in form only, for it breaks upon the least effort, even in unbending it, an inconvenience that will doubtless disappear as the manufacture is improved. Its specific gravity is 2·5 exactly the same as that of aluminium, if I may trust to a hurried trial. At this rate, the wire of $\frac{1}{3}$ of millimetre weighs only 20 centigrammes the metre; and that measuring 2 millimetres on the other hand, 7 grammes $\frac{20}{100}$ the metre, and if the first costs only 30 centimes the metre, the price of the larger wire will be 10 francs 80 cents. the metre.

I have experimented only with the wire at 50 centimes the metre, which is quite sufficient to give an idea of the intensity of and astonishing whiteness of this light. To inflame and burn it, it is sufficient to take a piece of a few centimetres in length, and holding it in a pair of pincers to avoid burning the fingers, then to put one end into the flame of a candle or a spirit lamp, until ignition takes place. As soon as it begins to burn, it spreads very rapily along the wire under the aspect of a dazzlingly brilliant little ball which throws up a white smoke and leaves the skeleton of the wire in the state of caustic magnesia. This light is, in fact, very intense, and extremely vivid. With a wire as fine as that indicated, the light emitted appeared to me equal to that of twenty candles, from which I conclude that the wire of two millimetres, burning with the same rapidity, will be equal to that of 300 candles. But the combustion took place at the rate of two centimetres the second, so that the the light of 300 candles during 50 seconds cost 10 francs 80 cents. This would be paying very dear for the commodity; but I speak now of this phenomenon only with the certainty of a lowering in price one-tenth at least, as soon as means are found of giving an almost invariable constancy of position to the light; and at 100 francs the kilogramme, this light will be, so to speak, economical and sure to be specially employed in certain cases, if we can succeed in perfectly regulating and concentrating the light in a small volume.

The magnesium light presents much analogy with that of phosphorus, but the absence of all danger and inconvenience in its preparation does not admit of our comparing them together in their economical employment; besides, magnesium being sold in the state of wire, offers great facility for using it. Phosphorus apart, it remains for magnesium to contend with pyrotechnic compositions. This is not too much, for to produce a light equal to 300 candles, we must employ chlorate of potassa, and act upon large quantities, which dissipate even more quickly than magnesium disengaging a suffocating and voluminous smoke.

The other applications of the magnesium light consist in the production of a very intense luminous point in the focus of a parabolic reflector, moving freely so as to convey signals to a distance, or for illuminating a glacis during siege operations.

From the moment that the problem of the fixity of the luminous point is solved, these two applications will be accomplished. It has been ascertained from experiments made in the harbor of Toulon, that a luminous point as large as a pea, giving only as much light as ten candles, radiating from the focus of a parabolic reflector as large as a hat, will illuminate a space of ten metres at a distance of 1,500 metres sufficiently to enable the smallest print to be easily read, and when it is desired to exhibit it as a lanthorn only, its intensity is equal to the light of a first-class light-house; with a fixed luminous point, this apparatus will become an excellent means for making signals both on land and at sea.

* * * * * * * * * * *

With a magnesium wire arranged for burning, we can always, without preparation or apparatus for gas or electricity, easily produce a light equal to 100 or even 300 candles during 10 seconds, which, with a reflector of 10 inches in diameter, will cause everything in advance to be seen very distinctly, and this will be the practical and the economical side; for a dozen of light-producing apparatus for gas or electricity, beside the encumbrance of transporting and the getting to work, will cost at least 5,000 francs, and with 5,000 francs, we could obtain by employing magnesium wire at 100 francs the kilogramme, the means of producing many signals; and at this price it will figure largely in military pyrotechnics.—*La Lumière.*

The Fluorides in Photography.

In the early days of photography, we frequently heard allusions to fluoride of silver as one of the bodies which might be expected, from its nature, to play an important part in photography. A recent paragraph in one of the journals revives the subject in mind, and leads me to ask the question, have any satisfactory experiments ever been made with this salt, and with what results? The paragraph in question, which appears to be answer to an inquiry similar to this, intimates that the Editor is not aware of any systematic experiments on the subject, but gives the following formula for an iodizing solution, as one published, but not recommended, by the late Mr. Archer ;—

Alcohol	1½ drachm.
Iodide of potassium	2½ grains.
Fluoride of do.	1 grain.
Bromide of do.	½ "

Can you tell me what would be the effect of the fluoride in collodion, and would it increase its tendency to become alkaline? Would it be likely to increase sensitiveness, or density, or give other good qualities? You have always been the staunch advocate of the bromides, but I do not remember that you have written anything on the fluorides. Please enlighten me, and add one more to the many favors you have conferred on photographers generally, and especially upon your's very gratefully, BETA.

[The use of the fluorides in photography was first suggested by Sir J. Herschell, and Mr. Hunt subsquently made some experiments with them, which are recorded in his "Researches on Light," but as he seemed to have some misconception as to the physical nature of the salts, much of the value of the experiment is vitiated. Some of Mr. Hunt's experiments suggest that a combination of fluorine, bromine and silver was extremely sensitive, and a preparation of fluoride of silver, when submitted to the solar spectrum, gave an image with some indications of the natural colors. Some other experimentalists have worked with fluoride of silver, but no results of practical value have been obtained.

The formula quoted by Archer by our contemporary, is scarcely likely to have been tried by either, inasmuch as fluoride of potassium is not soluble in alcohol, and could not be used in collodion. Fluoride of sodium might be dissolved in small quantities, but as fluoride of silver, when formed, is soluble in water and nitrate solution instead of remaining in the film, as the insoluble iodide and bromide of silver do, it would be dissolved out into the bath, and would not be likely to have much influence on the negative in any way.]—Ed. *Photo. News.*

On the Preparation of the Negative Nitrate of Silver Bath for Bromo-iodised Collodion.

The ordinary methods of preparation consist in dissolving iodide of silver in a somewhat concentrated solution of the nitrate, and then precipitating the excess of iodide by the addition of the requisite amount of water, so as to reduce the bath to its proper strength; or, by introducing into the plain nitrate of silver solution successive coated with iodised collodion, and continuing to do so till all destructive action on the sensitive film has ceased.

It is well known that some proportion of iodo-nitrate of silver is necessary in the bath to prevent the entire destruction of the sensitiveness of the few first plates that are immersed therein. But, perhaps, it is not so generally known that a much less proportion than what is usually deemed requisite to avert this evil will practically answer all the purposes required, and will, at the same time, leave a wide margin for the avoidance of other evils arising from an oppositecause. We have proved this experimentally. Moreover, we have found that a bromo-iodised collodion film is more slowly injured by a *pure* solution of nitrate of silver than a simply iodised film. Not only is this true while the plate is in the bath, but also when, after its removal, the solution adhering to the surface has become concentrated by evaporation. It is, therefore, important, seeing that bromo-iodised collodion is now almost universally used by photographers, to add to the nitrate bath only the minimum quantity of iodide required to prevent its attacking and destroying the sensitive surface of the plate. With this object in view, we recommend the following method of preparation of the bath, in preference to those usually adopted.

Supposing a bath of twenty fluid ounces be required of the strength of thirty grains to the ounce, proceed to prepare it thus: Weigh out 300 grains of pure re-crystallised (in preference to the fused) nitrate of silver, and dissolve in ten ounces of pure distilled water. Take five grains of iodide of potassium or any other neutral soluble iodide, dissolve in one drachm of pure water, and pour into this nitrate solution. Stir or shake occasionally for an hour or more to give the nitrate of silver time to dissolve a sufficient quantity of the recently-formed iodide. Then add ten more ounces of distilled water. Filter through double filtering paper once, twice, or three times if necessary, until the solution has become quite clear, and afterwards weigh out 300 grains more of nitrate of silver, and dissolve in the filtered solution.

The bath thus prepared will probably be neutral or sligtly alkaline to test paper, and will require to be slightly acidulated with nitric acid before it will yield clean, vigorous pictures. But it must be acidulated with great care, by adding no more at one time than a drop of the acid diluted with its own bulk of water, and by trying a picture on a small plate between each addition of the acid.

This bath is far from being saturated with iodide of silver, but sufficiently so for use. A collodionised plate excited in it and kept in a dark frame for twelve minutes, in a temperature over 90 Fah., lost apparently none of its creaminess of film, as was proved by cutting the plate in two and keeping one of the halves in distilled water for comparison with the other.

We may add an important precaution, which, under all circumstances, ought to be attended to by photographers if they wish to retain their negative baths in good condition for a considerable length of time:—*Make it a rule always to remove the plate from the bath as soon as possible after it has been completely sensitised.—Brit. Journ.*

The Camera with Conjugate Foci.

The ordinary camera is based upon the principle of conjugate foci, nevertheless we wish to give this special name to the instrument by means of which prints are obtained from a negative without any contact between the negative and the sensitive surface. This sort of camera includes the two foci within its limits, whilst with the ordinary camera one of the conjugates is outside of the apparatus.

The camera with conjugate foci differs from the ordinary camera in being furnished with two frames, one of which receives the negative, and the other the sensitive plate, the lens having a fixed position between them. After being properly foccussed, the places occupied by the negative and the ground-glass respectively are the conjugate foci. On the relation which exists between each of these foci and the lens depends the size of the print.

This camera, in the hands of an ingenious photographer, is susceptible of many very interesting applications. It serves to a certain extent for enlargements, for reductions, and furnishes a means of producing microscopic transparencies, glass views for the stereoscope, slides for the magic lantern, &c. Amateur photographers who happen to possess two ordinary cameras can easily make them to supply the place of a camera with conjugate foci in the following manner :—The two cameras are placed opposite each other on any level surface—as, for instance, a well-planed board; the first camera only is furnished with its lens, and the front of the lens ought to have some inches intervening between it and the circular opening in the second camera from which the lens has been removed. To avoid the influence of the lateral rays of light the space between the two cameras should be covered with a black cloth. The cloth should rest loosely over the front lens so as to permit of the easy manipulation of the rackwork. It ought to be possible, also, to place the whole arrangement on a camera-stand so as to be able to incline it towards the sky. When a larger picture than the negative is desired it is necessary to turn the lens end for end.—*Bulletin Belge.*

Interesting Electrical Phenomenon.

BY C. PIAZZI SMYTH.

I WAS merely trying the qualities of some newly-prepared dry plates by Mr. Nicol, by taking a window view of house tops, and was surprised to find every chimney top surmounted by a black streak or brush; *i.e.*, black in the negative, and therefore indicating light. Nothing of the kind was visible to the naked eye in the scene itself, as a really existent fact, nor was any similar appearance visible on the ground-glass of the camera. The appearance, therefore, did not result from any bad action of the lens, which is a very good one. The stop employed was a small one (0·3 inch); and the definition of the developed picture was extremely sharp. Again: the appearance could not be caused by smoke coming from the chimneys, because that hardly would have been luminous; not one-tenth of the whole chimneys could have had fires below them, and either smoke or rarified air would have drifted with the wind, which was blowing sensibly at the time, whilst the dark rays went upwards straight as arrows. Again: that the chimneys, as chimneys, had nothing to do with it was shown by a similar brush or ray appearing at the top of a certain little ventilator in the roof of one of the houses shown, and not out of the parts emitting air, but from the ornamental spike at the top.

This circumstance convinced me at the time that the phenomenon was an electrical one, invisible to the eye, but abundantly visible or sensible to the photographic camera, and the occasion was perfectly agreeable thereto; for it was at the conclusion of a week of unusually hot, calm weather, and the sky had that morning become clouded with forms of clouds eminently electrical.

Happily the thunderstorm did not break in this neighborhood, being wafted away elsewhere; but had it broken here the photograph tells exactly *where* the lightning was preparing to come down; and there is one tall iron chimney in the view, with the strongest ray of the whole above it, showing that that would certainly have been struck in preference to its neighbors; and, if unprovided with metal communication to the earth and water, would infallibly have caused mischief to the house to which it is attached.

I have sent a second plate taken six days afterwards, when east wind and rain had disposed of all the electricity that had been brewing in the air; and it will be seen that, although it is the same view, taken with the same camera, and the same sort of tannin dry plate, there are no electrical brushes or black rays surmounting the chimney pots.—*Brit. Journ.*

The Tax Law and Photography.

We bring together in this article all the provisions of the new tax law, which have a special bearing on our art; and add a few comments suggested by the enquiries of correspondents. The quotations are from the law as compiled by Horace Dresser, Esq., and published by D. Appleton & Co. If this presentation of the subject does not fully meet the wants of any of our readers, we will take pains to procure further and authentic information.

Licences.—The rates of licences are found in Sec. 79, par. 34, (p. 38, Appleton's edition) and are expressed in these words :—

" Photographers shall pay ten dollars for each license when the receipts do not exceed five hundred dollars; when over five hundred dollars and under one thousand dollars, fifteen dollars; when over one thousand dollars, twenty-five dollars. Any person or persons who make for sale photographs, ambrotypes, daguerreotypes, or pictures, by the action of light, shall be regarded a photographer under this act."

The provisions pertaining to licenses generally (forms, penalties, &c.,) may be found in Secs. 71-2-3-4-5. It would take up too much of our space to reproduce all these Sections.

The licence, when procured, should be safely kept, so that it may be found if wanted. As it is a paper somewhat ornamental it would not be improper to have it framed and hung up in the reception room.

Stamp Duties.—The rates of stamp duties are given in Schedule C, appended to the law, and are from in Appleton's edition, p. 94 as follows :—

"Photographs, ambrotypes, daguerreotypes, or any sun pictures except as hereinbefore provided, upon each and every picture of which the retail price shall not exceed twenty-five cents, two (02) cents.

"Exceeding the retail price of twenty-five cents, and not exceeding the sum of fifty cents, three (03) cents.

"Exceeding the retail price of fifty cents, and not exceeding one dollar, five (05) cents.

"Exceeding the retail price of one dollar, for every additional dollar fractional part thereof, five (05) cents."

The penalty for neglect to affix a stamp is ten dollars for each offence. [Sec. 165.]

Ad valorem Tax.—It is of course impracticable to affix stamps to certain kinds of photographs. To meet such cases, an ad valorem tax is levied, which is payable directly to the collector. This provision of the law is found in Sec. 94, p. 51, as follows :—

"On photographs or any other sun picture, being copies of engravings or works of art, or used for the illustration of books, and on photographs so small in size that stamps cannot be affixed, a duty of five per centum ad valorem."

The above are all the taxes to which photographers as a class are liable. In common with all other good citizens they must expect to pay something on their carriages, plate, jewelry, &c.

We have several times been asked what kind of stamps should be used, inasmuch as there are several under different names of the same value. There are as yet no stamps printed especially for photographs, and it is doubtful, unless photographers require it, if we shall have them. It is, without doubt, in compliance with the law to use any of the revenue stamps which are of the proper value. In this city, however, where all kinds of stamps are easily accessible, those designated as "Proprietary" are in almost universal use. As a matter of taste these should be preferred to the stamps marked Express, Telegraph, Bank check, &c.

The stamps on a fine photograph are unsightly. In one case, which occurred in our neighborhood, the customer refused to take the *cartes*, which had been stamped. But the law is plain; an unstamped *carte* cannot be sold without incurring the penalty.

Editorial Department.

——Save the silver, has been a frequent recommendation of this Journal; and the advice is not given in vain. There are very many of our readers who, at a trifling expense, recover more than one-half of the silver which they purchase. But there are others who, at much labor, save very little; what is the trouble with these latter? We have lately seen two lots of "waste," which contained the savings of two thriving galleries, which had been procured in the space of nearly a year; and the amount of silver in them did not pay the cost of separation. On enquiry, we learned that the method of saving in both cases was substantially the same, and was the one best calculated to collect a good quantity of dirt, while it permitted the silver to get away.

There is a fundamental principle which should be had in view by those who wish to save silver easily, and that is that the solutions from which silver is to be precipitated should be as strong as practicable. If any one has a doubt of it, let him try a few experiments: Dissolve 60 grains of nitrate of silver in a barrel of water; now recover the silver. Add to the barrel of solution of nitrate of silver, 60 grs. of salt previously dissolved in a small quantity of water. The nitrate is now completely converted into chloride of silver. Now the chloride is a solid body quite insoluble in water, and yet in this case the fact does not clearly appear The water is scarcely turbid, it goes through a filter unchanged and without leaving anything on it. Leave the whole mass of water at rest for a day, and the lower stratum will be slightly different from that on top but yet the chloride of silver is still entirely suspended. Let the water rest a month, and the precipitate will have fallen to the bottom, and by carefully decanting the water a considerable part of it might be recovered. If, instead of sixty grains of salt, a handfull had been thrown in, no precipitate would ever appear, for in that case it would have been completely dissolved. If any one will try the experiment during the pressure of business of his gallery, he will be thoroughly satisfied that it is not worth his while to save silver from very weak solutions. Dissolve the sixty grains of silver in half an ounce of water, convert into chloride, and the chloride can be recovered completely in a few minutes. From weak solutions precipitates are light and fine; from strong solutions, heavy and course.

The error of silver savers who fail, is the unnecessary dilution of solutions. There are various jimcrack contrivances which the inventors claim will keep back the silver, however much water passes through them; and they place them in sinks where all the washing water passes; these humbugs ought to be abolished. A two gallon earthen jar set near the developing place will save all the silver that is worth while to save from the developement in the largest establishment in the country. Let the waste developer and the first washings not to exceed two or three ounces for a 4-4 plate go into it; every morning pour off the water. A large vessel may be more convenient, but there will be risk of putting too much water into it.

——We have received information of the decease on May 22nd, of Mr. Hezekiah Grice, of Port au Prince, Hayti.

Mr. Grice was born in Baltimore in 1801, emigrated to Hayti in 1832, where for many years he served his government as the director of public works. He was a noble specimen of the Negro race; he was well acquainted with prominent business and scientific men in this city; in his presence the distinction of color was forgotten.

He was for many years a subscriber to this Journal, and a zealous friend of the art; he introduced photography to his countrymen.

Minor Correspondence.

O. A. K., of Iowa.—"What is the very best corrective for a foggy nitrate bath? also the best and simplest intensifier? ....Suppose you ask your doctor what is the very best corrective for a disordered stomach, or your laundress, what is the best and cheapest washing machine. It is much easier to ask such questions than to answer them. Any short reply is of necessity incomplete. If the bath be new and a drop of acid ineffectual, try sunning. If but little strengthening is needed sulphuret of potassium is the best.

L. R. G., of Wis.—Please send us some account of your new devices, We trust they will prove as valuable as you hope.

A. E. K., of Mich, and many others concerning taxes, we refer to the article on page 117.

A. N. L., of O.—The tax is on the picture and not on the frame or case. The frame, case, &c., have already paid taxes as manufactures. A man is taxed for only what he produces.

C. & P., of Mass.—"I made a new bath for negatives last week. The first plate I developed immediately turned black. I think I must have got something wrong in the bath. What shall I do with it to make it work again?" ....There are many things (mercury, sulphurets, etc.) which put into the bath will cause a general blackness on developing. The best remedy for a new bath is sunning.

A. N. R., of R. I.—There are very few photographers who use alcohol in the developer. You ought to be pleased to find it useless while alcohol costs so much.

A. G., of Conn.—There are varying prices charged for the 15-gr. bottles of chloride of gold, and generally the value of gold is proportioned to the price. When coin is quoted at $2 50 you must not expect to get a genuine 15 gr. bottle for $1. The manufacturers of chloride of gold and nitrate of silver pay a tax of five per cent.

R. M., of Ind.—You are pretty sure to get the worst of the bargain if you patronize the traveling purchasers of silver waste. You may be certain that these men calculate to make enough to pay traveling expenses, as well as the cost of reduction. Twenty per cent. is too much to pay for the reduction of a valuable lot of waste.

S. R. V., of N. Y.—There is no doubt that an alkaline condition of the printing bath prevents in great degree the turning red. Albumenized paper is now so made that it is not injured by the ammonia in the silver, and we now advise that the ammonia be added till the bath is distincly alkaline.

R. S. M., of Wis.—Your question, "who makes the best collodion?" "reminds us of a little story"—but we haven't room to tell it, perhaps you know it, of the remarkable modesty of the phrenological lecturer. You make us blush, —really.

J. M., of N. Y. We know nothing good of A. S. & Co. *Caveat emptor*.

H. K. A. Jr., of N. Y.—Your pictures deserve a first rate notice and you shall have it.

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[NEW SERIES.]
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On the Glazing of Photographic Prints by Means of Collodion.

BY A. MATTHYS, S.J., OF ANTWERP.

A Spanish photographer, by means of a varnish applied to his prints, gives them much warmth and brilliancy; but, unfortunately, his process remains a secret. A photographic chemist is believed to have discovered in this varnish the agency of albumen. Whatever it may be, I have, by the help of collodion, produced a means of giving to pictures the same amount of brilliancy. The operation is simple, and many hundred proofs can thereby be glazed in a day; the whole, indeed, consists in pouring collodion upon a sheet of glass and to that applying the proof. I will now state the chief precautions which it will be necessary to take :—

Choose paper that is thin enough, and that is highly albumenized. Take collodion that is not iodized, and which contains double the quantity of pyroxyline used for photographic collodion. The glass, then, being cleaned, the collodion is poured on in the usual manner, and left to evaporate for several minutes, more or less, according to the temperature of the laboratory. Generally speaking, five minutes will be sufficient. It is then to be immersed in a bath of rain water and left there until the film is uniformly moistened, when it must be removed and placed in a horizontal position. Presently it is to be inclined a little towards the operator that the small quantity of water left on it may collect at one edge, when the proof must be taken from the bath of water in which it has been previously deposited, allowed to drain for an instant, and then placed upon the glass, commencing at that edge where the water has collected, and gradually lowered like a sheet of paper upon a silver printing bath. The little water serves to remove any air bubbles which may form between the proof and the glass. After this the proof may be placed upon blotting paper and by a gentle pressure of the hand the water may be forced out. The glass is now to be left to dry spontaneously, and when the paper appears dry to the touch it is to be removed, beginning at one of the corners. If, however, its adhesion to the glass be such that it is liable to be torn in this process, all risk is removed by placing it for an hour or two in a moist atmosphere, a cellar, for instance, or simply in a box containing a wet sponge. Practice will show easily what other precautions are necessary. The principal difficulty consists in preventing the formation of air bubbles during the drying of the paper. But if you would succeed, a thin, smooth, and well albumenized paper must be used. The proof may also, if the operator think fit, before being applied to the collodion film, be floated for an instant upon a lukewarm solution of gelatine.

Iodized collodion may be used, but more pyroxyline must be added, and the glass, when coated, must be left for a considerable time in the water that all the iodide and bromide may be dissolved. It is not necessary to renew this water. Old collodions give a slightly yellow tint, unless a little hyposulphite of soda or cyanide of potassium be put in the first washing water.—*Photo. Notes.*

New way of Strengthening Negatives.

Our readers are aware that some few weeks ago we published a translation of a pamphlet by M. Blanquart-Evrard, on the "Intervention of Art in Photography,"—a work of very great interest, containing the particulars of a new method of intensifying a negative, or any part of it, by simply exposing it to light for an hour or two before it is fixed. The fact that light intensifies very considerably an unfixed negatives was discovered lately by the writer of this pamphlet, and he has shewn, by excellent examples, how the fact may be employed in improving the artistic character of negatives without injury to their details. The subject has not yet received the attention which we think it deserves for photographers generally, but a few intelligent and thinking men have made a note of it, and endeavored to explain the very singular fact that a negative can be intensified by exposure to light. At a recent meeting of the Photographic Society of Scotland, Mr. J. T. Taylor made the following remarks on the subject, and endeavored to interest the members in it :—

" It was now beginning to be generally known that light exercises a continuation of the reduction of silver in a collodion film in which a picture has been developed, the atoms of silver of which the picture consists either becoming darker in their color, or then receiving an accession to their numbers from the decomposition of the iodide of silver left in the film. The latter hypothesis seems the more reasonable, and we would commend the subject for investigation by those experienced in the use of the microscope; for, as the change takes place with considerable rapidity, it might easily for a few minutes be watched under a power sufficiently high to show the atoms of which the deposit consists. What was interesting for them to know at present was the fact that light continues the densification of a developed image; and it was interesting, not more from the chemical principal involved, than from the pictorial results which could be produced by a judicious application of that power which enabled them at will to intensify any part of any negative, thereby securing greater brilliancy in some parts than in others. If it were desirable that an obtruding "bit" should be sunk into the shade, the simple application upon the negative of an opaque body, such as a piece of dark paper, with a subsequent exposure to sunshine, would at once secure this desideratum. In illustration of the foregoing remarks, he exhibited a negative which had been feebly developed, and one-half of which had, after a thorough washing, been exposed to the sun's action, the other half being shielded by a piece of cardboard. The contrast, in respect to density, between the two ends of the negative was very marked."

We find it difficult to offer any plausible solution of this singular effect of light upon a negative from which the iodide of silver has not been removed. There are however two facts in connexion with it which must not be overlooked in any attempt at an explanation. One is the well-known fact that light does *not* intensify a negative *after* the removal of the film of iodide of silver; for common negatives are not intensified by being exposed in the printing frame. The other is, that a negative from which the iodide of silver has *not* been removed is *not* intensified by light, if it has received a thick coating of varnish, so as to protect the film from contact with the atmosphere. It should also be observed that in order to intensify an unfixed negative the *back* of the film must be exposed to the light, and not the front. It is tolerably evident, therefore, that the density of the negative is not increased by an action of light upon those dark particles which already constitute the picture; and since the light has no perceptible effect in darkening the film of iodide itself, the conclusion is inevitable that the intensification is produced by an action of light upon the mixture of the iodide of silver with the dark material of the picture, in contact with the atmosphere. There is no doubt that if this action of light upon these materials could be satisfactorily explained, it would clear up one of the chief difficulties in the way of forming a correct theory of the action of light upon the haloid salts of silver.

We were curious to know whether M. Blanquart-Evrard could himself throw any light upon this subject, or whether he had explained the curious phenomenon which he had been the first to discover; and we therefore wrote to him to enquire what his views might be, or whether he had any rational explanation to offer. He immediately sent us the following letter in reply to our enquiries :—

"My Dear Sir,—With respect to the theory of intensifying the negative image by light :—

It is extremely simple, and I cannot conceive why you do not understand it.

I will enter into some details.

When you develop an image, you have upon the glass plate,

1st. A film of collodio-iodide of silver,

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2nd. The reduced silver precipitated upon this film, and which constitutes the image.

3rd. Some free silver reduced in excess, which the developer and the washings remove together.

Therefore, after the negative has been dried, there will only remain,

1st. A film of collodio-iodide of silver.

2nd. The reduced silver deposited upon this film, viz., the image.

Now, first, it is a chemical law that iodide of silver is not blackened by light. We may therefore expose the plate to light without seeing the film of iodide become darker.

In the next place it is a chemical law that silver in a state of extremely fine division, when placed in contact with iodide of silver, is influenced by light; the colored oxide is formed, &c.

Here then is the explanation of our operation.

The support of our image—that is to say, the film of iodide of silver—will remain intact under the action of light; whilst all the metallic molecules deposited within its pores, and at its surface, will be impressed by light, and will take a higher degree of coloration with oxydation.

You see it is extremely simple, and evident, because if you change the chemical nature of the support, and re-iodize or fix the negative, so as only to leave a simple film of collodion, the image is not oxydized. Also, if you varnish an image upon collodion before fixing it,—that is to say, if you seal it from contact with the air and moisture,—the light will not darken it, and the very slight change of color which occurs will be that of the varnish and not of the image. I think these few words will suffice to explain to you the whole economy of my process, and give you the scientific reason of the remarkable result which it yields.

BLANQUART-EVRARD."

[Now granting that our worthy friend is right in his supposition that the metallic particles of the image become oxydized and darkened in color by exposure to light in presence of iodide of silver, it still remains to explain *why* they become thus oxydized. Does the iodine of the iodide of silver take hydrogen from the atmospheric moisture, while the liberated oxygen goes to the metallic silver? Our friend does not tell us and his explanation is incomplete.

There is a remarkable analogy between the intensifying of an unfixed negative by light, and the production of an image in the camera upon an iodized Daguerreotype plate; because in both cases a film of iodide of silver is exposed to light with a layer of metallic silver beneath.

Our chemical readers should bestow their attention upon the important new fact which has been observed by M. Blanquart-Evrard, and endeavor to offer a full and satisfactory explanation of it.—*Photo. Notes.*

Conservation of Vital Energy.

On Thursday week, Professor Helmholtz concluded his course of lectures at the Royal Institution, "On the Natural Law of the Conservation of Energy." In these lectures the object of Prof. Helmholtz appears to have been to extend the principles discovered, or first publicly enunciated in this country by Mr. Joule, that heat has its mechanical equivalent into which it can be converted, and that all the physical forces are closely related to each other, as expounded by Mr. Grove. In accordance with these views no force can be exerted without some other force is brought into action, and no force can be destroyed, for its action produces other forces equivalent to the one that has been exhausted. The application of these principles to vital energy was the principal object indicated by Professor Helmholtz, but he did not enter into the investigation of vital principle, nor did he further consider it than to poiut out that the amount of action exerted under its influence is proportioned to the amount of physical force supplied to the body.

In Thursday's lecture he stated that the quantity of carbon, of water, and of hydrogen exhaled and excreted from the human body can be made to do the same amount of work as the same quantities of those elements of food and oxygen taken into the body. He explained that increased exertion produces an amount of heat equal to do the same amount of work as that effected by muscular action, and that increased exertion is at the same time maintained by the larger quantity of air inhaled, which may be increased in a ten-fold degree.

"The human body, viewed as a calorific engine, is capable of doing much more work, compared with the fuel consumed, than any steam-engine. It has been estimated that the pulsations of the heart in one hour generate a force that would raise that organ of the body 22,000 feet high, while the same amount of heat applied to the best constructed steam-engine would not raise the engine more than 2,700 feet. Professor Helmholtz explained and illustrated the effect of muscular fibre in exciting electricity by applying the muscle of a recently killed frog to a galvanometer; and he showed the opposite effect of the excitement of muscular action by electricity by the application of a galvanic apparatus to the muscle. Though pointing out this close connection between electricity and nerve force, he did not enter into the question whether the excitement of the living nerves is in any manner attributable to electricity. This was the point on which he seemed to stop short, for in some parts of his previous lecture he intimated an intention of investigating that subject.—*Morning Post.*

The Functions of Art.

We want in art the mind of a poet-thinker, turning everything into living gold; and after an exhibition has been gone through, and the physical fatigue of the process is over, he alone should be dignified with the name of an *artist* who has taught us how to see, or how to feel, or how to think more truthfully and more beautifully than before. Take aspiration away from art, and it becomes so much dead lumber. If it leaves its votaries with just so much indifference to bad things, and no more love of good things than they previously possessed, it has failed of its purpose; and is like an instrument from which no music can be evoked,—a bell that will not ring, a book that proves to be nothing but leather and wood.

Very often indeed the painter comes forward as the expounder of our great writers, and many works receive high praise upon the mere technical grounds that the art-spelling is done properly, when no art-words are put together by which the verse of the poet becomes a stronger and more exquisite reality in our minds. If reading the poem gives us a better picture, the painter has been of no use. We are entitled to ask him to do more for us than our own imagination could easily body forth. Failing in this, however clever he may have been with his fingers, we do not thank him for his brains.

The artist goes forth at all seasons of the year into the country, and in due course elaborates his landscapes. Here again, after demanding technical correctness, we are entitled to ask for something more. If his canvas looks like the place, and that is all, his human intellect and heart have done little more for us than the photographer's chemicals and lens. If we go to the spot he depicts with no finer associations than we should have had without him; if he has given us small help in seeing, and none in the loftier process of linking together the beautiful and the true; what ought we to care for his work, although its precision might serve to guide the career to the roadside inn, or suggest to maternal solicitude a convenient situation for sea-bathing when the children's holidays arrive?

There is a class of landscape very common in our galleries, and yielding ample profits to its producers; we mean that in which some harsh and discordant effect of blazing light and color is repeated with certain changes over and over again, and year after year. In another case a man carries his own eternal tameness to every scene—his waterfalls are composed of the same soapsuds, his trees have the same mild stems, and the same pale green leaves; his rocks are smooth enough for the drawing-room table when the cover is off, and his skies simper with one unvaried smile. He is no helper to see or think, not an *artist*, however deftly his brush may glide. Certain other men have discovered an "effect" that will sell, and they produce their effect year after year, just as the crockery-maker gives us the everlasting willow plate. In many instances, a certain crotchery egotism and mannerism always comes uppermost. It is evident that artists of this stamp do not look nature honestly in the face. They project one side of themselves upon all they behold. They are not interpreters of nature, nor can be until they have exorcised the demon of self.—*Intellectual Observer.*

The Albumen Surface Corroding during the Washing of Prints.

Sir,—I wish to ask your opinion as to the enclosed specimens, they being a portion of a day's printing done on Saturday week. I was at first inclined to think that by some inadvertence some cyanide had been sprayed over the prints, but in that case the action would not have been uniform on a large number of prints I now incline to think the spots are caused by a kind of fungus in the albumen.

As I said, these are prints produced on a Saturday and left in water till Monday. I had laid them aside to show any of my friends, and the matter had almost escaped my memory, till again, last Monday, my assistant drew my attention to the matter, by saying that "the prints this morning are nearly as bad as those were last Monday," and so I found them to my cost. I noticed, also, that the prints had a very offensive smell, like rotten cheese.

I may add that in both instances I had repeatedly changed the water during the Sundays, and also examined the prints and found them quite perfect, so that the defect, whatever it may be, is clearly due to the prolonged soaking, as no trace of it has ever appeared except on the Monday, when the prints have been washed twice the usual time. George Robert Fitt.

[The prints enclosed by Mr. Fitt, are covered with myriads of small spots, in which the albumen is attacked, exhibiting a corroded appearance. We remember seeing some prints in a similar state some years ago, under just the same circumstances, the prints remaining in soak from Saturday till Monday. It was found at that time, we believe, that some soap had fallen into the water, and the corrosive action was attributed to a caustic alkali. Have any of our readers any experience of such cases?]—Ed. *Photo. News*.

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A Brussels gentleman has sued a photographer for exhibiting his likeness at his shop door—the man was ugly and the photograph was uglier. The plaintiff said that he had lost the chance of a rich marriage, the lady having seen his picture refused to be introduced to the original.

The Chemistry of Gelatine.

BY DR. F. GRACE CALVERT, F.R.S., F.C.S.

[The application of gelatine to photographic purposes gives an especial interest to the following remarks on gelatine, glue, bone-size, chondrine, their preparation, chemical properties, nutritive value, and application to arts and manufactures, extracted from one of the recent Cantor Lectures, delivered at the Society of Arts, and given fully in its Journal.]

As the syllabus will show you, I intend to draw your attention, especially in this lecture, to gelatinous substances as well as to the art of tanning, There are four distinct gelatinous substances obtained on a commercial scale from animal tissues and bones, viz., *osseine*, which I mentioned in my last lecture, *gelatine, chondrine* and *isinglass.*

Osseine, as already stated, is the animal matter existing in bones, and no doubt it is the same substance which also exists in skins, both during life and when recently removed from the animal. It is characterized by its insolubility, its inability to combine with tannin, and, lastly, the facility with which it undergoes a molecular change, and becomes converted into gelatine, slowly, when boiled with water at 212°, rapidly, when boiled under pressure at a higher temperature, and very gradually under the influence of putrefaction.

Gelatine is a solid semi-transparent substance, which absorbs water in large quantities (40 per cent.), becoming thereby transparent. It is very slightly soluble in cold water, but very soluble in boiling water; and this solution has the characteristic property of forming a jelly on cooling. So powerful is gelatine in solidifying water, that one part of gelatine will form a jelly, with 100 parts of water. It has been observed that gelatine loses this valuable property, if boiled for a long time at ordinary pressure, or if carried to a temperature above 223° Fah. Before examining the interesting actions of acid upon gelatine, allow me to mention that whilst solid gelatine resists putrefaction for a long time, its solutions have a tendency to putrefy rapidly, but I have the pleasure to inform you that a few drops of a substance called carbolic acid will prevent putrefaction for a long period. Gelatine dissolves readily in acetic acid of moderate strength, or vinegar, and this solution, which is used as glue, has the useful property of remaining fluid and sound for some time. But a Frenchman, named Demoulin, has introduced of late years, in Paris, a solution of glue which is superior to the above and to that in common use, because it does away with the trouble of heating the glue-pot. His process consists in melting one pound of the best glue in one pound of water, and adding gradually to the two one ounce of nitric acid of sp. gr. 1·36, heating the whole for a short time when the fluid glue is prepared. The action of concentrated nitric acid on gelatine is most violent, giving rise to several compounds, amongst which may be cited oxalic acid. The action of sulphuric acid on gelatine is important, in a scientific view, as an alkaloid called leucine is produced, as well as a sweet substance, called glycocolle, or sugar of gelatine. Gelatine is distinguished from other organic substances by the following chemical reactions :—It gives a white precipitate with alcohol, also with chlorine, none with gallic acid, but one with tannin, or tannic acid. The properties of this precipitate are most important to us, as it is on the formation of it in hides that we ascribe their conversion into leather. The relative proportions of these two substances (gelatine and tannin) in the precipitate varies with their respective proportions brought into contact, but precipitates containing as much as 46 per cent. of tannin have been examined. It is insoluble in water, and presents the invaluable character of not entering into putrefaction. Beautiful fancy ornaments have recently been introduced in Paris, by M. Pinson, called artificial tortoiseshell, which he obtains by melting at a moderate temperature, gelatine with a small amount of metallic salts, rnnning the whole into moulds, staining the mass with hydrosulphate of ammonia, so as to produce an imitation ot the grain of the tortoiseshell. The objects so produced are then polished and then ready for sale. Before entering on the manufacture of various qualities of gelatine, I should wish to state that there can be no doubt, from the researches of Magendie, as well as from the report of the commission appointed by the Netherlands Academy of Sciences, that gelatine as food possesses no nutritive value whatever.

Allow me now to give you a rapid outline of the methods followed in the manufacture of various qualities of gelatine. The first quality of gelatine is prepared by taking the clippings, scrapings, and fleshings from the tanyard, treating them with lime water, or alkali, to remove any smell and certain impurities. They are then well washed and left in contact for a day or two with a solution of sulphurous acid. They are then placed in a suitable apparatus with water, and heated when the osseine is converted into gelatine. This is run into a second vessel, and a little alum added, to throw down any impurities that may be in suspension. The liquor is now ready to be run into another pan, where it is concentrated to the necessary consistency, so as to become solid, when it is run into wooden moulds. Eighteen hours afterwards the gelatine is turned out of these moulds on to a wet slab, where it is cut into slices by means of a copper wire; these slices are placed on wire gauze frames, and left in a drying shed until they are perfectly dry and ready for the requirements of the trade. The second quality of gelatine is prepared by placing bones in large cylinders, and allowing high pressure steam to arrive at the bottom of the cylinder, which rapidly converts the osseine of the bones into gelatine, and the removal of this is facilitated by allowing a stream of hot water to enter the upper part of the cylinder. The solution of gelatine thus obtained is evaporated, and is usually employed for the preparation of glue. A third quality is prepared by treating bones with hydrochloric acid (as referred to in my first lecture), and submitting the osseine thus obtained to the action of steam. Lastly, a fourth quality of gelatine, called bone-size, is manufactured by boiling more or less decayed bones, as imported from South America and elsewhere, the flesh of dead animals, &c., and concentrating the solution to the consistency required for the various applications it receives in commerce. [The lecturer then described the mode of obtaining the beautiful thin colored sheets of gelatine used in photography, and other fancy purposes, and also the characteristics which distinguirhed good from bad glue.]

Chondrine, or cartilage gelatine, first noticed by Messrs. Müller and Vögel, jun., is interesting, as possessing qualities, not only different from those of gelatine, but such as injure the quality of the latter when mixed with it. In fact, it gives precipitates with acetic acid, alum, persulphate of iron, and other salts; and as gelatine is often used in connection with these substances, it is easy to foresee how these precipitates may interfere with its application. On the other hand, the quality possessed by this peculiar gelatine, may, I think, render it serviceable in the art of calico-printing, for fixing colors, or as a substitute for albumen or lactarine. Thus the solution of chondrine and acetic acid may be mixed with any of the new tar colors, and the whole printed, allowed to dry, and steamed; the acetic acid will be driven off, leaving the color fixed by the chondrine on the fabric. Chondrine is prepared by submitting to the action of heat and water the cartilagenous tissue of animals or the bones of young animals.

Isinglass is obtained from the air-bag or swimming-bladder of several kinds of fish, especially those of the sturgeon tribe, and, although imported from various parts of the world, the principal supplies are from Russia, from whence the best qualities come, which bear the name of Beluga, Volga, or Caspian Sea leaf. Brazil, New York, the East Indies, and Hudson's Bay, also supply various qualities of this valuable substance. It also reaches this country in different states, viz., in leaf and in honeycomb, that is, the bag is cut open, cleaned and dried; and the quality called snow-bleached is enhanced in value by having been buried in snow on the banks of the Volga for a long period, by which the isinglass is whitened. Pipes, purses, and lumps are bags which have been cleared but not opened; and a quality called ribbons is made by rolling the bag and cutting it into strips before shipping it to this country.

I shall now endeauor to explain to you how the beautiful preparations before you, for which I am indebted to the kindness of Mr. James Vickers, are obtained. The leaf bladder is first softened in water, and rolled out, under high pressure, into thin leaves which may extend to several feet long; these, in their turn are drawn under a number of revolving knives, making 1,000 revolutions per minute, by which 6,000 of the well-known fine threads are produced in every minute. This quality is chiefly used for culinary purposes. For commercial uses the purses or lumps above mentioned are chiefly employed. These are soaked in water for two or three days, cut open, certain useless parts removed, further softened, rolled, and cut into various dimensions, according to the requirements of trade, their chief use being the clarification of beer, and other alcoholic fluids, for which gelatine cannot be employed, because it dissolves in water while isinglass merely swells. The result is that the highly-swollen and extended mass, when poured into beer, wine, or other alcoholic fluids, is, on the one hand, contracted by their alcohol, and, on the other hand, it combines with their tannin, forming an insoluble precipitate, which as it falls through the liquor, carries with it the impurities in suspension, and thus clarifies the fluid. As isinglass is very slow in swelling out in water, brewers employ an acid fluid for the purpose, but strange to say, instead of using pure acetic acid, many of them take sour beer, and thus run the great risk of spoiling their sound beer. I have known instances of great losses occurring in this way, acetous fermentation having been thus spread through an entire brewery during the summer months. As a large quantity of gelatine, cut into shreds, in imitation of isinglass, is sold at the present day, it may be useful to know that detection is very easy, by the following method :—Place a small quantity in hot water, in which gelatine will readily dissolve, whilst isinglass will do so very slowly. I cannot conclude the examination of this interesting class of substances without drawing your attention that osseine, gelatine, chondrine, and isinglass present marked differences in their textures and general properties, although their chemical compositions may be considered identical, thus:—

	Osseine.	Gelatine.	Chondrine.	Isinglass.
Carbon..........	50·4	50·0	50·61	50·56
Hydrogen........	6·5	6·5	6·58	6·90
Nitrogen.........	16.5	17·5	15·44	17·79
Oxygen...........	26·2	26·0	27·37	24·75

Esculent Nests.—I must not omit to mention, in connection with this interesting class of substances, these curious gelatinous products, which are not only considered great delicacies in China, India, but even in Europe, where they realise from £3 to £7 per pound; considerable quantities are imported into England. It has long been a disputed question what is the chemical nature of the substance composing these nests, which are the product of a peculiar kind of swallow : but Mr. Payen, by his recent researches, has left no doubt in the minds of chemists that it is an animal, not a vegetable matter. In fact, it is a peculiar mucous substance secreted by the bird, and composed of carbon, hydrogen, oxygen, nitrogen, and sulphur. Further, it is insoluble in cold water, but soluble in boiling, and differs from gelatine and isinglass in that it does not gelatinize as it cools.

Indian Ink.

The above is a black pigment brought from China and Japan, which, on being rubbed with water, dissolves, and forms a substance resembling ink, but of consistency well adapted for working with a camel-hair or sable pencil, on which it is much used as a a color in miniature painting, and in all drawings in *chiaroscuro*, or where the effect is produced from light and shade only.

The preparation of India ink, as well as compositions used by the Chinese in painting, is not based on any reliable authority, being shrouded in a considerable quantity of "trade haze and secret fog." The composition appears, by experiment, to be the coal of fish bones, or some vegetable substance mixed with isinglass size, or other size in conjunction with honey or sugar, to prevent its cracking.

A substance much of the same nature and applicable to the same purposes may be formed in the following manner :—Take of isinglass three ounces : make it into a size by dissolving over the fire in six ounces of soft water. Take then Spanish liquorice one ounce, dissolve it in two ounces of soft water over the fire in another vessel, then grind on a slab with a heavy muller one ounce of ivory black with the Spanish liquorice mixture. Then add the same to the isinglass size while hot, and stir well together till thoroughly incorporated. Evaporate away the water, and then cast the remaining composition into a leaden mould slightly oiled, or make it up in any other convenient way. This composition will be found quite as good as the genuine article. The isinglass size mixed with the colors works with the brush. The liquorice renders it easily solveable, on the rubbing up, with water, to which the isinglass alone would be somewhat reluctant; it also prevents it cracking and peeling off from the ground on which it is laid.

A good Indian ink may be made from the fine soot from the flame of a lamp or candle received and collected by holding a plate over it. Mix this with the size of parchment, and it will be found to give a good deep color. Burnt rice has been considered by some a principal ingredient in the genuine Indian ink, with the addition of perfumes or other substances not essential to its qualities as an ink.—*Brit. Journ.*

Positive Printing Without the Use of Hyposulphite of Soda.

At a meeting of the French Photographic Society, which took place on the 5th inst., M. l'Abbe Salvy submitted to the Society some positive proofs without the employment of hyposulphite of soda as a fixing agent. He described his process in the following manner :—

My proofs are fixed without hyposulphite of soda—a fact which doubtless ensures for them much greater permanency than that possessed by photographs with chloride of silver.

I have first to acknowledge that it is to Sir John Herschel I owe the ideo of this process. He has shown, some years since, that if a paper prepared with citrate of iron be exposed under a negative, and then placed on a bath of nitrate of silver, an image is obtained. These facts, perfectly true in themselves, yield however but very mediocre results; and so, without abandoning a method of printing which seemed to me so full of promise, I applied myself to render it more perfect. After numerous experiments, I obtained the proofs now submittted for your inspection, which do not perhaps possess that excessive delicacy and brilliancy pecular to albumenised paper prints, the absence of which is compensated for by a softness and richness of tint which is never obtained by the ordinary processes.

Instead of putting the paper on the silver bath after insolation, I combine the salts of iron, and then expose.

My solution is thus prepared. In one bottle I put—

Water	2 ounces.
Oxalate of iron	53 grains.
Citrate of iron	88 "

In another—

Water	2 ounces.
Nitrate of silver	53 grains.

I mix these two solutions. A precipitate of silver is formed, and the clear supernatant liquor is the sensitising solution. This is spread upon paper by the aid of a brush, or, still better, poured into a dish and the paper floated thereon. The excess of solution is then absorbed between folds of blotting-paper, and then the paper is exposed. The image being produced, it is washed in several changes of clear water, and finally for a few minutes in a bath containing a few drops of ammonia.

The tone of the proof varies with the degree of humidity of the paper. If it is used perfectly dry, it is of a beautiful orange yellow.

When the liquor is acidified with acetic, oxalic, or citric acids, proofs are obtained offering two tints perfectly glaring. On this account it is best to allow the deep shadows only to appear in the pressure-frame with just a faint commencement of the middle tints. The tone is deep brown. The image is then exposed to the vapor of ammonia. All the details soon appear, of an orange-yellow color, which can be changed by means of chloride of gold, or, still better, by the sel d'or de Fordos et Gelis, employed in the proportion of three grains to a pint of water.

The whole of the operations do not occupy more than twenty to twenty-five minutes, from the sensitising until they are completely finished.

I had almost forgotten to say that the paper best adapted for the purpose, as yielding the best results, is that manufactured by Turner, of Chafford's Mills, in England. This arises, doubtless, from the method of sizing.—*Brit. Journ.*

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The last novelty in London and Paris is the photographic letter signature: Note and letter sheets are now got up with miniature oval photographs of the person using them affixed to the right hand lower corner of the last page, after the words "very truly yours," which are printed in the usual place. They are getting to be quite as fashionable as the carte de visite.

Copying.

BY OSCAR G. MASON.

ALTHOUGH much has been already published upon the subject of photographic copying, there is undoubtedly yet much room for improvement. In that particular branch of our art many or all of the profession have much tolearn, and much already learned has yet to be brought into practice, as a few very simple proofs will demonstrate.

A photographer in a small country town is requested to make a 12 × 15, or 14 × 17 copy of some small daguerreotype, ambrotype, or card picture; but having only $\frac{1}{4}$ or $\frac{1}{2}$ size combination lenses for his ordinary portrait work, he feels compelled to decline an order for such an unusual size as 12 × 15 or larger, and consequently sends one of his best customers away with the idea that he cannot get his copy made in the country.

The photographer has told him that "such orders come in so seldom," that he could not afford to keep the necessary instruments for executing them. Now this humble disciple of Daguerre, did not think or know that his $\frac{1}{4}$ or $\frac{1}{2}$ size was sufficient for his purpose; and that very likely the city photographer who might receive the order which he refused, would use no larger or more complicated apparatus than he had in his own unpretending gallery.

Or some patron wishes a large photographic copy of a daguerreotype in which the sitter is reversed, the right appearing the left, and *vice versa.* He wishes the large copy reversed from the original picture, so that the parting of the hair, or any peculiar marks of the features may appear in their natural position, but our photographer tells him that it is impossible; or perhaps that in order to produce such a metamorphosis he will be obliged to make a copy, and then copy from that again, instead of finishing the first copy from the original—thus losing much of the finer definition.

He has forgotten, or did not know, that by the use of a reflector properly arranged, or a re-copy by transmitted light in an improvised solar camera, he might retain the work of his would-be patron, and in the same do himself credit, and retain the profit which otherwise goes into the hands of another who uses perhaps the same means which he had under his command. Or, if he has thought of all these advantages and uses them, perhaps the original may have been made in the early days of the art, when the daguerreotypists' buffs were not made of the finest chamois and filled with the finest of rouge, and he sees that the polish of the plate was *not* such as to give the "invisible surface," but rather that the surface is very visible on account of the many scratches which cross it in the direction of the last buffing, which scratches persist in appearing provokingly plain in his enlarged copy.

His customer is dissatisfied and does not seem to give credit to the statement that "it cannot be helped." Again the photographer has forgotten that a smooth copy might have been made by having the light strike the original at a less acute angle with the buff marks, and he is surprised and chagrined by having a fine city copy shown him from the same plate a few days after his statement of the impossibility of such a production.

Many daguerreotypes after laying several years, have become changed, the surface of the plate being slightly oxydised by the slow action of the atmosphere. After a picture has been so clouded or stained it is necessary to remove the veil or stains before a good copy can be made. The usual method by the use of a weak solution of cyanuret ef potash will not invariably produce the desired renovation. In a certain stage of the daguerrotype process the plate after being gilded is often left in such a condition that neither water, alcohol, or cyanuret of potash solution will flow evenly over the surface.

In the early days of the art, the writer was often annoyed and perplexed by such condition of pictures handed in for copying until by accident he found a sureandsimple, though novel solvent' for the oily-like film which was so impervious to the attack of all previously tried solvents. The remedy is, cover the plate with saliva, and the action is immediate and effective, and without the least injury to the most delicate daguerreotype. After the plate has been so treated, the saliva is washed away with water, which then flows freely over the whole surface, after which the oxydisation may be removed by the diluted solution of cyanuret of potash.

Another source of perplexity which the unexperienced copyist meets with is, the imperfect reflection produced by the convexity or concavity of the plate on which the daguerreotype is made. This can be avoided only by straightening the plate which must be done with great care, avoiding all contact with the surface of the picture.

For the production of the finest copies of daguerreotypes and other pictures upon metal or glass, light should fall upon the original from *one direction only.* The writer has found his greatest success in the use of a direct or reflected light through a side window. Of course experience teaches every one in the profession that a picture must be parallel to the camera in order to produce the best results, this is very easily effected by the following described method :—

A smooth, flat board, of sufficient width for the copying camera, to the edges of this board fasten thin strips to project about one-half inch above its upper surface, for the purpose of keeping the camera parallel with the board and at the same time allow of its being easily moved back and forward.

A piece of board about ten inches long and of sufficient width to fill the space between the long or copying board, is provided with on upright piece of the same width and about fifteen inches long, so that the two when fastened together form an L. On the face of this fifteen inch upright of the L are fastened two bevelled strips of wood, so that a second upright piece of board nearly as wide as the other may easily slide up and down, and be retained in its place by thumb-screw through the back of the upright part of the L; thus the perpendicular motion is obtained.

With the two motions thus arranged, it is evident that any point of height or lateral motion may be given to the picture which is being copied. But to obtain the right position in the most convenient way and least time. After fastening the picture to the front board, the camera may be slid forward until the tube is near the face of the picture, which can then be raised, lowered, or moved to the right or left, as may be required. The picture is thus kept exactly true in a right adgle to the axis of the lens, and the whole can be placed on a table or stand near the window, or laid aside when not in use.

The writer has found it to be a very efficient and simple arrangement which answers most admirably the purpose, and would save much time and perplexity were it generally adopted, instead of trying to get the picture in position for copying without some similar arrangement. It is so simple that any cabinet maker, house-joiner, or carpenter, could easily construct one in a few hours and at a trifling expense.

For making copies of large pictures, such as paintings, engravings, or drawings in sections, a description may be given in a subsequent article.

* * *

The New Tax Law.

In traveling about the country for my summer vacation, I find among photographers quite important differences of interpretation regarding the new revenue law for sun pictures.

Some put on stamps to the full value of the picture including case, frame, and coloring.

Others do not put on stamps for the coloring of a photograph, but do for the case of an ambrotype, &c. Of course some are wrong, and the question is, who are right?

Mr. James Cady, a photographer well known in the city for the past fifteen years, takes the broad ground that the words and terms of the act can include only the sun picture in its simplest form—as it comes from the action of the chemicals and light.

Instance, if a customer brings in a case containing a glass, mat and preserver, and wishes a picture inserted, you charge him, say one or two dollars and put on a five or ten cent stamp; that of course would be correct, and would be the same if he had purchased the case of yon paying two or three dollars extra for it.

A more marked instance illustrating this principle is when photographers keep gold lockets, as many do, selling them at a certain price including the picture of the customer inserted: say the locket is worth ten dollars and the picture one dollar, could any one suppose it necessary to affix fifty-five cents in stamps to that picture? Yet such would be the fact if the term sun picture is held to include the case containing it; for in principle it makes no differense whether the case is made of gold or paper.

The rule then is to estimate the value of the sun picture, the same as you would charge to insert it in the customer's own case, the same size, he furnishing everything but the plate which contains the picture.

So of photographs, the stamp is affixed according to the price in the simplest form they are sold, mounted on cardboard—any retouching, coloring, framing, or other extra finishing which increases the cost, is not counted in the estimate. Instance: a plain photograph which you make for two dollars is ordered colored to be worth ten dollars, you will put on a ten cent stamp instead of a fifty cent one.

This may seem so self-evident that it is not worth telling, but as I happen to know that many are acting otherwise, I communicate the opinion with the hope that it may save some "greenbacks" to members of an over-taxed profession. E. K. Hough.

* * *

Major Correspondence.

(C. J. B., of Ohio, to Carl Meinerth.)

I beg your pardon for misrepresenting you by saying that you complained of the blistering of albumen paper. It was not intentional, and I shall be careful hereafter not to misrepresent *any* one.

Please accept my thanks for your delightful "down-east sea-breeze" information, and for the beautiful samples you sent me.

It appears to me that it would require something more than a "common-sense reader"—even a *very scientific one*, to be able to translate "thirty" to mean sixty, and be sure that he was correct. But it was not the thirty grain bath that was referred to, it was the *twenty* grain bath in the following sentence of yours:—"How any one nowadays this side of the Styx can still prescribe an eighty grain bath as a *conditio sine qua non*, when one-quarter (twenty) as much (with common sense and care) will produce the same results, is beyond my comprehension." It was the "one-quarter as much" in the preceding sentence, that attracted the attention of your "common subscriber."

I have seen the fuming process recommended, also the use of nitrate of soda, for diminishing the amount of silver used in printing, and have heard them condemned.

Although I never take any man's "say so," if the time and means are at my command, to investigate and decide for myself, yet I have but little time for experimenting on disputed questions; though nothing would please me better, if I had the time to spare. My printing and toning baths having always produced good results with an eighty grain bath, and having all the work that could possibly be got through without any assistance, I thought it not worth the while to try any anything new, my time being worth as much as the amount of silver that might be saved by some other process. But seeing your article in the Journal, brought me to the conclusion that there might be some economy in saving three-fourths of the silver, if it could be done.

You seemed to insinuate that my negatives were not good, but to satisfy you that such is not the fact, I will enclose for you, to the Editor, some of my photographs, on the back of which you will find my address; so that if you wish you can reply to me directly, and that we may not consume any more of the editor's room and patience.

If you will carefully read "The Printing Bath," by J. J. G., on p. 67, AM. JOURN. PHOTO., you will *perhaps* be able to *comprehend* why an eighty grain bath is still prescribed by artists 'on this side of the Styx.'—Truly yours in friendship and art. C. J. B.

Editorial Department.

———In our last we pointed out one of the chief errors of many photographers who are desirous of saving—namely, the error of diluting silver solutions so much that the precipitated chloride would not settle. The silver thus washed away is practically annihilated, it will never again be collected for the use of mankind.

There is another source of loss to photographers, which, although not so complete, is yet perhaps more vexatious. It is the selling of silver waste for less than its value. There are perhaps a score of men traveling about the country, who do a thriving business, we are told, in purchasing silver waste from the unwary. Now a moment's reflection ought to satisfy any one that even if these men had the disposition they would be unable to pay the value of the article and at the same time be honest towards the cost of traveling and other expenses of carrying on the business On the liberal supposition that each of these men pay for silver savings $10 per day, another $10 at least should be paid for expenses, this sum of $20 then comes out of the pocket of the photographer, and then gets back in its place only one-half of it. Photographers should either extract the silver for themselves, or send it to persons legimately engaged in the refining business who have a reputation to lose.

———The suit of Wing *vs.* Richardson, involving the validity of Wing's patent plate-holder for producing the "gem" photographs, &c., in which testimony was taken in August, has been adjourned to the 10th of October. The case is before the U. S. Circuit for Mass., held in Boston. The adjournment is for the purpose of giving the plaintiff an opportunity to procure testimony, in reply to one of the witnesses on the other side. A final decision may be expected next month, and our readers will be advised of it at the earliest moment.

———We have been informed that the Internal Revenue Department has given a decision on the question discussed by Mr. Hough on page 141, and the decision is adverse to the opinion of Mr. Hough; and that which we gave in our answer to A. N. L., p. 120. We will try to procure the fullest information for the next Journal.

Minor Correspondence.

W. M., of C. W.—"Could you manage to send me an ounce of your negative cotton by mail? I should like to try it, but the duties and other charges on it by express would be expensive unless with a large bill." ....Gun-cotton would probably never reach you by mail. Your government surely cannot allow smuggling to be carried on by the post-office department.

H. R. P., of N. Y.—"In your July 1st No., you answer questions for me. You say, 'Make your bath alkaline with potass or ammonia.' I have never used either of them for neutralising, and wish to know what preparation of each is used, whether it is aqua amm fortis or some other preparation of ammonia? To make nitrate of ammonia silver into plain, you say, 'Evaporate the solution and keep the residue in fusion for a considerable time.' How shall I evaporate in a common evaporating dish and fuse in the same, and how long is a considerable time?. ....By ammonia understand "ammonia conc.," and by potash "caustic potash." ....Use the same evaporating dish for the boiling and fusion; a common porcelain dish is what you need. During the fusion a considerable portion of the silver will be separated as metal or oxide, which in the end must be dissolved by addition of nitric acid. If you will try the process you will have a clearer notion of what we mean by "coasiderable time" than we can give you in a few words. Short answers must often be a little indefinite. Suppose you H. R. P. tells us in a couple of lines how long it takes to get the pot a' boiling?

E. W., of Pa.—"Do you consider it best to print transparencies on glass by natural or artificial light? Is it best to reduce chloride of silver by zinc and sulphuric acid, or by fusing with potash and soda? I would like to get one of those pemphlets which J. Stock & Co. said they would issue. can I obtain it by applying to Mr Wright?" ....If the camera be used you must have daylight. For printing by contact we recommend aatificial light. ....We prefer to reduce chloride by fusion for the reason that it is more speedy. ..Apply to Mr Wright.

A. S. A., of N. Y.—"How can I save the silver in the hypo. soda bath?" ....Precipitate with sulphuret of potassium.

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[NEW SERIES.]

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On the Methods of Enlarging Photographs.

PHOTOGRAPHY had not enjoyed an existence of many months until enlargements were attempted. These, in the first place, consisted of enlarging natural objects; but, by-and-by, as intense sharpness began to be obtained in the negative (this sharpness being consequent upon the substitution of glass for paper as a basis upon which to receive the image), photographers began to consider the propriety of freeing themselves from the encumbrance of a large and heavy camera for field work, and substituting a smaller and more portable one, for obtaining negatives so sharp as to admit of subsequent magnifying, so as to bring them up to what they considered the standard of a large-sized picture. This gave an impetus to the construction of small sized cameras, so furnished as to allow the wet collodion process to be practised in the open fields without the operator being encumbered with more baggage than was compatible with pleasure on his tour.

The various pieces of apparatus produced, and often patented, from time to time, for enabling wet collodion to be practised without a tent, fully attest the skill and ingenuity brought to bear upon this branch of photographic art. Formerly the system of enlargement was peculiar to landscapes, taken under the circumstances hinted at. At present it is a recognised branch of professional business, applied mainly to the reproduction of portraits on a large scale. So important, indeed, has this application become that we find several photographers who make a speciality of it.

The simplest and most obvious manner by which an enlarged image can be projected will be ascertained by the following remarks. We shall suppose that the picture to be operated upon is a negative, *carte de visite* size, and that the picture has been set up against an even uniform light, such as that of the sky. If a quarter-plate camera be placed at the distance of a few feet and focussed on this negative, the resulting image on the ground-glass of the camera will be very small; but as the camera is made to approach the negative—re-focussing at each move—it will be found that the image on the ground glass becomes larger and larger until at a certain place it becomes of exactly the same size as the negative. Approaching nearer still, the image on the ground glass becomes rapidly larger than the original, until a point has been reached at which the image has been magnified to many feet in size, provided the camera had been large enough to show the full size, and long enough to admit of the extension requisite to produce a focus. As soon, however, as that stage has been passed at which the image on the ground glass became of the same size as the original negative, it would be necessary to reverse the lens—to turn it "end for end" in order to secure the most perfect sharpness; for, when operating with a portrait lens, which is the best form of lens for this purpose, it is necessary that the front lens of the combination, when in its normal state, should be nearest that particular plane which is farthest away from it. Thus, so long as the image on the ground glass is smaller than the object being copied, thus far must the front lens of the combination be placed next to it, and *vice versâ*. A large camera, then, capable of expanding a considerable distance is necessary for the production of an enlarged picture.

A sharp magnified image having been obtained on the ground glass, the next consideration is how to fix it. The diffused light of the sky passing through a small lens will produce an image sadly wanting in illumination; and, were a collodionised plate placed in the focus, a long exposure would be required to impress the image, the length of the exposure depending upon the amount of the enlargement.

When a negative three by three and a-half inches, and very full of detail, without much density, is made use of, and the image is projected upon a moist sheet of sensitive paper, so prepared as to be subsequently developed, the exposure will be about fifteen to twenty minutes when the enlargement is made up to about thirty inches in size. If, instead of the blue sky, a white sheet of paper is placed at an angle in front of the negative, so as to be strongly illuminated by the sun the exposure will be very much reduced; and if instead of that an arrangement were made by which the direct rays of the sun could be brought to pass through the lens, the exposure with the sensitive negative paper alluded to would be a matter of seconds, and not of minutes.

The latter arrangement is easily effected when the whole camera apparatus is either pointed to the sun or to a mirror, from which the solar rays are reflected. In this case it is necessary to have a condensing lens placed between the negative to be reproduced and the source of light, whether this be the sun or artificial light. If the former be used the apparatus used is a solar camera; if an artificial light be employed the appropriate name for it, we suspect, will be a magic lantern. The principal of both is similar. And this leads us to observe that we have frequently obtained enlarged negatives by means of the ordinary gas burner, and a quarter-plate portrait combination. When the condenser (three and a-half inches in diameter) is tolerably good, and the stop in the lens is about the size of a sixpence, if the image be magnified from three and a-quarter inches square to four and three-quarter inches, the exposure on a wet collodion plate, with gas of a fair quality used for illumination, will be somewhat under two minutes, or about one minute and a-half. From this may be deduced the time of exposure requisite when the light is brighter, or the enlargement greater.

When ordinary *sky* light is used without any condenser, it is, as we have said, necessary to use negative iodised paper on which to receive the image.

The qualities required for such paper are sensitiveness, cleanness in working, combined with the capability of giving brilliancy of results. Various kinds of paper and preparations are said to supply these conditions, but the following will perhaps be found to be as good as any. A sheet of hard, thin, uniform paper is immersed in a bath made as follows:—Take one drachm of gelatine, which after being softened in a minimum quantity of water is afterwards dissolved by having poured over it one pint of hot water in which is afterwards dissolved the following salts in the proportions annexed :—

Iodide of potassium	3 grains.
Bromide of potassium	5 “
Chloride of barium	5 “
Gelatinised water	1 ounce.

After remaining in this for a few minutes until saturated, it is then dried. When about to be used it is floated for three or four minutes on a nitrate of silver bath sixty grains to the ounce, to which has been added acetic acid in the proportion of ten or twelve minims to each ounce of solution. The addition of the acid ensures cleanness, but the proportion may be considerably varied, according to strength of the acid, and the particular kind of paper employed. Instead of floating the paper on the solution, its surface may be excited by brushing it over with a camel's-hair brush, or a Buckle's brush, or by means of a glass rod.

Without allowing the paper to dry thoroughly, it is now stretched flat, placed in the focus of the image, and exposed. The exposure no matter what light is used, should be such as to show feeble details of the image. If nothing at all be seen on the paper, it may be concluded that the exposure has been somewhat short; but, if on the contrary the image appear in a decided manner, there is much reason to believe that it has received too long an exposure. A few trials will indicate this better to a careful operator than all that could be said upon the subject.

The development is thus effected :—Remove the sensitive impressed sheet into the dark room, and, laying it on a clean sheet of paper, convert it into a dish, *pro tem.* This suggestion, which, if we remember rightly, first emanated from our friend Mr. Warren, of Newcastle-on-Tyne, is a most valuable one, saving the trouble and expense of a large bath, with the additional advantage of greatly increased efficiency in the operation. The edges of the paper, to the depth of about half-an-inch, are bent up at right angles to the sheet, and secured at the corners with a little thick gum, a silver pin, or otherwise. Into this extemporised tray is poured a saturated solution of gallic acid, which by means of a Buckle's brush (a tuft of cotton stuck into the end of a glass tube), is spread all over the surface of the paper which, under present circumstances, forms the bottom of the tray.

The picture, some of which was feebly visible before commencing the development, now rapidly acquires vigor. The result is completely under the control of the operator; for, at any stage great vigor may be given to the details already visible by adding a little aceto-nitrate of silver to the gallic acid. Instead of acetic acid, the substitution of citric or tartaric acid will affect differences in the tone of the finished picture. Mr. Sutton used to advocate lemon juice as the best form in which this restraining acid could be employed: and from the two or three trials we made of it, we think his commendation was fully merited.

All we have formerly advanced in these Lessons concerning the appearance of over and under exposure in *negatives*, applies equally to *prints* which have been "developed" into existence, and to these remarks we refer the reader.

The print being well developed, the gallic acid is removed by a copious application of water, after which it is fixed by a solution of hyposulphite of sodo in the proportion of one ounce of the salt to four ounces of water. Plentiful and thorough washing must succeed the operation of fixing, after which the picture is dried and mounted.

As we have hinted, almost any variety of tone may be obtained. The particular kind of vegetable acid with the quantity of silver employed in developing render this entirely under the control of the operator.—*Brit. Journ.*

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Photography on Canvas.

BY ERNEST LACAN.

M. Libert has communicated to me a process which he has employed successfully for six years past in obtaining amplified proofs on canvas for painting. The canvas primed with white lead, stretched tight on its frame, is to be first washed on the surface with alcohol at 36°, applied with a large and soft brush. Let dry in the shade, then brush it over with a solution of :—

Common water	500 grammes.
Bicarbonate of soda	50 “

until the canvas assumes a uniform white tint. Next wash by pouring over the canvas, set sloping, the contents of a watering pot, and leave it to dry in the dark. Thus prepared the canvas is ready to receive the salt and nitrate of silver, like the positive paper. The salt bath is as follows—

Common water	500 grammes.
Chloride of ammonium	10 “
White gelatine	1 gramme.

The gelatine must be of the best quality. Dissolve it in a small quantity of warm water; it must then be added to the solution of the salt, which should also be lukewarm in winter.

In most cases solution of the salt may be employed without the addition of organic matters, which are only required as a vehicle to render it capable of reproducing greater delicacy and distinctness of outline, and may very well be dispensed with when the canvas is to be covered with painting, for then the sketch is all that is wanted.

The salt bath is to be applied with a brush like the preceding solutions, taking care that the coat is very level, in order that the impression may be uniform.

When this new coat is dry, it must be sensitised in the dark room with a solution of ammonio-nitrate of silver, applied with a brush or a cotton dabber, reserved expressly for that purpose. Now expose it in the solar chamber as if to print a proof on paper, and let it remain till the image has acquired nearly the tint it should have when finished. Fix it immediately by covering the surface of the canvas with a solution of—

Hyposulphite of soda	50 grammes.
Common water	500 “

This solution, poured on freely, so as to cover the whole surface of the canvas equally, must be left on the proof three or four minutes only. Then pour it off and wash the canvas under a tap. Lastly, cover the proof with a solution composed of—

Common water......................	300 grammes.
Sulphuric acid......................	30 drops.

Two minutes will suffice for the effect of this last solution. Next wash the proof with an abundance of water, dry it, and the image will be ready to receive the paint.

Should the image not have all the delicacy of outline of those printed on paper, it will, nevertheless, be more than is absolutely required to serve as a sketch.—*Brit. Journ.*

Photography vs. The Printing Press.

The question what newspapers will come to with the price of white paper continually advancing, is one which publishers would like to be able to answer satisfactorily to themselves and to the public. It is now more than three times the price that it was before the war. Some newspapers put up their prices correspondingly, others diminish their size to meet the increased expenses. The latter resource as a remedy, is, vulgarly speaking, 'nearly played out,' for the newspaper has not a margin to act upon it in the descending scale, anything equal to the ascending scale of prices with the paper maker. A reading public want something larger than a Treasury note for a newspaper, though treasury notes are considered valuable reading if people only have enough of them of their own of the right denomination. Intrinsically, paper is becoming like gold, an article of value, and nobody who has to buy it ever speaks of it contemptuously as "rags," probably because a great deal of it is nothing but straw.

The resources of chemical and mechanical art fail to supply a remedy to the publishers' distress. The only one we can think of in this emergency is suggested by a combination of the science of optics and the art of photography. Mr. Langenheim, the ingenious and enterprising photographer, has succeeded in impressing the whole of the Lord's prayer upon a photographic print scarcely larger than the head of a pin, which, under a magnifying glass can be so brought out that any person, who has eyes that he can see with, can read it.

Now we suggest that as paper is so valuable, that the "forms" or types as orranged for newspapers, be photographed in the same way, and each purchaser provide himself with a good magnifying glass so as to bring the reading out to the right size. This would be such a saving in the consumption of paper, that the manufacturers would soon be willing to compromise with the publishers and let them have paper at a reasonable price. There would be an advantage to the reader as well as to the publisher in this arrangement. By using greater magnifying power the reader could make the type suit his eyes, and increase it to any reasonable size, removing at once all cause of complaint that the types are too small. Those who are fond of big stripes and swelling head lines, could magnify them to any size they please, and get the worth of their money in astonishment if not in information. Politicians could give greater emphasis to their big ronnd expletives when viewed through such a medium, the only drawback would be that their libels upon each other would look so large that they would be ashamed to see them next day staring them in the face. A candidate for office, jealous of the reputation of his opponent, could so diminish his praises by a skillful application of the glass, that he could see no merit in the individual at all. If the paper manufacturers could be compelled at once to look at their prices through a continually diminishing medium, there might possibly be no necessity for the improvement we suggested.—*Phila. Ledger.*

On Fogging.

After about fifteen years of uninterrupted sunshine, I find myself *at last* in the land of fogs. Circumstances over which I have no control (the best of wives "accidentally" upset my old bath in hunting for a charming negative I had taken of a young lady who was on a visit to us) obliged me to undergo the awful ordeal of making a new bath.

With the overweening confidence induced by long success, I poured my developer over the exposed plate, when, oh! horror! a fog—none of your half-and-half fogs, but a darkness that might be felt (and I felt it)—spread itself over my negative. Too long an exposure—something wrong in my camera—stop too large—added nitric acid to bath— four more plates exposed to test each of these evils—still the fog, the unmitigated leathery fog! Oh, I have it! Why, of course something has got into my developing solution! Made a new one—exposed again—to my mortification my *now old* friend re-appeared.

After several restless nights—during which the best of wives intimated that our fair visitor was a nasty, forward hussy, and too ugly even to make a good *carte.*—I got up one morning at daybreak telling my wife to go to Bath, rushed into my "Smartt" tent put in my little back yard, mentally exclaiming "Eureka!" My yellow window must have faded, of course. Now I shall end all my troubles with two folds of yellow calico. In the dark, intense mental excitement and perspiration, I watched the result of my precautions. Alas! the same old story—fog again!

I made a new bath, I tried different collodion, I fitted up a little operating room to avoid the close atmosphere of the tent, I made three new and different kinds of developers, I drank three glasses of hot grog—all with the same result. I fancy it was even a little worse after the grog. Fairly beaten, I am ashamed to confess I had the meanness—the contemptible, sneaking meanness—to buy a bath solution ready made. And I hardly know whether I feel sad or rejoiced to tell you I produced with it a clear negative.

I am still in the dark, or rather fog, as to the cause of my failures; but a "party" has suggested that I must have been using collodion made with methylated spirits (——'s for iron development was the kind I had been using). Can any of your readers inform me whether my difficulties have arisen from this source? How can I ascertain the fact? I have not tried the old collodion in the new bath for fear of spoiling it. I shall wait to hear what you say.—I am, yours, AN OLD FOGY.

P.S.—I have been a subscriber to your Journal from the beginning, and have to thank you for enabling me to avoid many difficulties.

[The failure in the foregoing case most probably arose from organic impurities. Had our correspondent subjected his fogging bath to the mode of treatment pointed out by us, (sunning, &c.,) he would, in all probability, have saved himself from what he has very correctly designated as the "sneaking meanness" of buying a bath solution ready prepared. He, and other readers similarly situated, will learn much from a few experiments directed towards converting an old fogging bath from the errors of its ways, towards cleanliness, clearness, and every other virtue which a good bath is supposed to possess. We have put it in the power of all our readers to effect this change, and by a simple and inexpensive process. It is also possible that the collodion may have had something to do with the fogging.]—Eds. *Brit. Journ.*

Chemical Preparations for Photographers.

We extract from the *Notes* the following notices of chemicals prepared under the direction of Mr. Sutton, for photographers. These notices although evidently written for effect as an advertisement, will be found of considerable interest to our readers.—Ed.]

Pure Nitrate of Silver.—It is of the utmost importance to use pure recrystalized nitrate of silver in the negative collodion processes, and also in printing by development upon paper. When common nitrate of silver is used, merely crystalized from the mother liquor, the negatives are thin, veiled and streaky; and the bath is useless until it has been acted on by carbonate of soda But with the pure recrystalized nitrate you may take good negatives with a fresh bath which has not been doctored in any way. Pure nitrate of silver in solution does not redden litmus paper; and when the collodion is good, the negatives, if developed by pyrogallic acid, exhibit a fine surface bloom, and red density by transmitted light.

The pure nitrate of silver sold by Messrs. Bailey in hermetically sealed glass tubes, which bear our label, is absolutely neutral to test paper, and has been trebly recrystalized.

Intensifier for Negatives.—This is a rather strong solution of Iodide of Mercury in Chloride of Potassium. It is a clear liquid, and has a yellowish tint. It must be diluted with two or three times its bulk of water unless the negative is exceedingly thin and poor. It is to be poured over the film and allowed to remain on until the required increase in the density is obtained; after which it may be returned to the bottle, and the negative must be thoroughly washed. It changes the color of the negative to a greenish-black, which is very non-actinic, and at the same time adds more material to the dark parts of the image. The same solution may be used over and over again without becoming turbid; and the operation of intensifying may be conducted in broad daylight. There is great comfort, economy, and cleanliness in using this intensifier, and it does not render the details coarse and thick, but preserves their delicacy.

Negatives developed with iron to the thin stage which is suitable for copying by the Solar Camera, may afterwards be sufficiently intensified by this solution to be used in the common printing frame.

The reason why negatives so frequently require to be intensified after their development, is that inferior chemicals are used, and the picture would therefore be fogged by the iron if it were left on long enough to do its work properly. With good chemicals the development may be pushed to its extreme limit without fogging the plate, and then no intensifying will in general be necessary.

Spirit Varnish.—This is a solution of bleached lac in alcohol of suitable strength. The negative must be dried and very slightly warmed before a red fire before applying the varnish, and it must afterwards be held before the fire and heated very strongly. It may happen with some kinds of collodion that the varnish will dissolve the film and ruin the negative. In that case the alcohol in the varnish is too strong for the collodion; and the remedy is to pour over the negative after it has been washed a solution of gum and let it dry upon it; this film of gum will then protect the collodion film from the action of the varnish.

This Spirit Varnish gives a very hard and transparent film, which cannot be easily scratched by the nail, and which does not become tacky in the printing-frame.

The reader is cautioned against using some of the Spirit Varnishes in the market, which contain improper gums, that render the film tacky when heated by the sun.

Kerosolene Coating Fluid.—This is used in the Dry Collodion processes, in order to prevent splitting and wrinkling of the film

It is an infallible remedy for these evils; in fact it causes the film to stick so fast to the glass that it is very difficult to clean the plate afterwards, and get it off. The Coating Fluid is a thin solution of gutta-percha, and it is first applied to the plate in the same way as collodion, and then, when it has set, the plate is held before a red fire and made very hot, so as to melt the gutta-percha and make it stick fast to the glass. The collodion is then applied and it holds on to the gutta-percha and bites into it, because ether is to some extent a solvent of gutta-percha; and thus we have a collodion film cemented to a polished plate, and incapable of wrinkling or splitting. When the coating fluid is used the dry collodion film may be washed violently without any fear of its leaving the glass, and what is of great importance, no wrinkles can be formed on it. At the same time, it is well to do without this application of coating fluid, if you can, because it involves extra trouble in the preparation of the plates. It must be regarded chiefly as a means of rendering the process more certain in cases where failure would be a serious loss.

Edging Varnish.—When no coating fluid is used, it is absolutely necessary to apply a narrow edging of varnish all round the sensitive dry film, by means of a camel-hair brush; for unless this is done the film is nearly sure to be torn in the various washings by the water getting under it at the edge. The Edging Varnish which we recommend for this purpose, and the cleanest and most effective in a solution of gutta-percha in chloroform.

The plate must be quite dry when it is applied. Of course this only prevents splitting, and not wrinkling of the film. Some persons put the Edging Varnish round the glass plate *before* applying the collodion, but that is more troublesome than to coat the entire plate with the coating fluid, and not so safe as to apply it to the dry collodion film.

Spirit varnish does not hold the film down so tight as a solution of gutta-percha,—and black varnish is detached by the water, and the plate becomes covered with black particles which sometimes stick to it, and spoil the negative.

Calcio-Chloride Toning Solution.—This is a clear, colorless solution of a double salt of gold, for toning prints. It is permanent and always ready for use, and may be used over and over again until fairly exhausted of its gold. This solution when diluted with about five times its bulk of water, tones slowly, and does not therefore injure the brilliancy and vigor of the print. Quick toning in a strong gold bath is much to be condemned, because it is liable to make the print mealy. Slow toning, (half an hour say) gives the finest and most vigorous proofs, and time is in reality saved by it, when you have a large number of prints to tone, because you can put a large number of prints at a time into the same dish, and without troubling yourself to watch them constantly, provided the dish have an occasional shake to keep the prints from sticking together. Absolute blacks are got by this bath if you push the toning far enough, but in general the warm chestnut black is the finest. Remember that the prints dry darker than they look in the last washing water. The old toning bath should never be thrown away, but fresh solution added to it as it becomes weakened by use.

The calcio-chloride toning bath acts remarkably well with our patent albumenized paper, made by Lampray & Co.

Photographic Tints.—It is sometimes an improvement to a positive print, to tint or dye it with some delicate pale color. For this purpose we have selected six of the most beautiful aniline colors and these are put up in a concentrated form in small bottles, and the whole enclosed in a case. A few drops of the color must be added to a pint of water, and the print, fresh from the last washing water, steeped in this dye for a minute or two, and then hung up to dry. The most suitable general tint for prints is mauve, but it must be extremely pale.

We do not think any of these tints at all likely to affect the permanency of the print. They are suitable both for plain and albumenized paper, and are a great improvement when the lights are showy, and particularly in stereoscopic slides. Hard pictures are much softened and improved by the use of them.

Print Varnish.—This is a solution of colorless drying oil in Benzole. It is intended to be applied to prints upon plain paper such as solar camera enlargements, and it adds greatly to the depth and juicy vigor of the shadows, and takes off their sunken appearance in the paper. It also preserves the print, by rendering the paper less pervious to moisture. Should any sulphide of silver remain in the paper, the application of this varnish will immediately cause it to appear, so that the varnish becomes a test of the proper fixing of the print. It dries quite dead, and does not give the slightest glaze to the paper. It may be applied to mounted prints. The best mode of application is by a camel-hair brush.

Comic Photographs.

We have received specimens of a couple of comic photographs of a political design, got up to amuse people who admire comic art. One represents McClellan, Fremont, Lincoln, and Butler, grinning through horses collars for the Presidency, the ugliest to win; under which rule it is an even thing between Lincoln and Butler. The other picture represents Jeff. Davis and Satan playing a game of chess. The humor of the picture, we suppose lies in the figure of Mr. Lincoln, who is represented as a "winged angel!" The circulation of this picture among juveniles would be likely to discourage the singing of the hymn, "I want to be an Angel," if Old Abe is a specimen.—*Eagle.*

Rapid Collodion.

BY L. PERROT DE CHAMEUX.

In a recent communication I stated my conviction that the formula of a collodion for obtaining rapid proofs was matter of complete indifference, but that, on the contrary, it was the silver bath that played the principal part. I reason as follows: collodion is of itself an inert body, which plays only one part, that of maintaining a film of iodide of silver on the surface of the plate. Now, whatever the formula employed, whatever the soluble iodide we make use of, an iodide of silver is always formed in the nitrate bath, which, when well washed, will be nearly insensible to light. The recent discovery made by M. Poitevin, of the sensitizing influence of tannin upon inert iodide of silver, seems to me to demonstrate in the most evident manner that the sensibility of this body depends solely upon the substance with which it is in contact, and with moist collodion, this substance is no other than the nitrate bath. If one iodide gives results which another does not, it is because the salt formed by double decomposition possesses a peculior action. It is in starting with this idea that I made the experiments described in my previous communication, and the result, as I have stated, had proved my anticipitions.

I now have to communicate to you a fact which corroborates this thoery in quite an unexpected manner. One of my friends, to whom I had given the explanations that you have published in your journal, wished to try and neutralize his bath with carbonate of potassa, put into the same bottle—reflected that he thus always obtained carbonate of silver, and that he avoided the trouble of washing the precipitate. When he proceeded to make use of it, he quickly recognized the rapidity and intensity that I had met with myrelf; but he remarked, that his negatives had no longer their usual aspect, but were harder and more violent in their contrasts than usual; in a word, they had all the appearance of those obtained with collodion sensitized with iodide of potassium and yet he only had made use of cadmium and ammonium. Taking the same collodion, I tried it myself with the bath prepared as I have described to you, and this effect has completely disappeared; it reappeared upon putting a little nitrate of potassa into the bath which shows indisputably, it seems to me, all the action of the film of the nitrate bath which covers the iodized surface and all the importance we must attach to it.

You will pardon me for insisting upon this idea; but as I believe that in seeking rapidity in the formula of the collodion, we waste time unprofitably, it seemed to me *à propos* to notice the fact, which, when once known, will not fail, I am convinced, to gain supporters.—*Le Moniteur.*

New Method of Analysing Ether.

One of the chief difficulties of photography, and one of the most frequent causes of failure, arises from the impurity of the materials. Amongst them the one whose composition is most variable is unquestionably ether, and yet it is upon its good quality that the beauty, stability, and adherence to the plate of the collodion film depends. Dealers in chemicals sell it of the same nominal strength, yet, notwithstanding this guarantee, the results vary, for the ether is not what it appears to be.

The densimeter is, in fact, powerless, in the present state of things, to indicate the real strength of the ether. The crude liquid does not, like alcohol, contain two bodies only (alcohol and water), it contains three (ether, alcohol, and water), and the proportion of the two foreign bodies may vary without the densimeter indicating the slightest difference in its specific gravity.

This difficulty of appreciating the value of commercial ether has struck M. Adrian, pharmaceutist, of Paris. Having recognized that the cause of the imperfection in the densimeter was due to the fact that the mixture sold as crude ether contained three substances, he has sought for the means of arriving by a densimetrical experiment, at a strict appreciation of the value of the mixture.

He operates in the following manner : As ether is a very volatile substance, he employs an apparatus which consists of a test tube closed with a ground glass stopper, through which a thermometer passes to the interior, and which must always show a temperature of 60° Fah. By means of a Gay Lussac's densimeter he takes the specific gravity of the crude mixture. This done, the ether is poured into a bottle, and shaken up with some carbonate of potassa, which removes all the water, and leaves only a mixture of ether and alcohol, the specific gravity of which is again taken, and by means of an easy calculation the proportion of each of these liquids in the crude product is ascertained.

To simplify still further this method, the operator can employ the tables published by M. Adrian in the *Journal du Pharmacie et de Chimie*, and then no calculation will be required. It is indispensable that all the operations be made at a temperature of 60° Fah., a temperature adopted to regulate the densimeter, because the mixtures, being no longer the same before and after treatment with carbonate of potassa, the dilation varies, and the tables of corrections made for the alcohol, the elements of the problem being threefold, are not the same as in the circumstances where we repeat them.

These operations are simple and easy, they only require care and a certain skill in manipulation.—*Le Moniteur de la Photo.*

Photography Inefficient.

At Bregi, a village on the banks of the Marne, which meanders through the pleasantest Parisian plains and falls at last into the Rhine, lie the ashes of Daguerre, to whom we are indebted for the art which bears his name. He died so late as 1850, having revolutionized our domestic enjoyments; and every chamber in every dwelling unconsciously pays him tribute. He was the poor man's artist, yet few of us are familiar with his features, though they should be affixed to every photograph-album. Great as were the benefits he conferred upon us, the art which he bequeathed is still far from accomplishing all that we wish.

If anything be most clamorously attributed to photography, it is the fidelity of its pictures to the original. Yet small consideration will suffice to convince any one that fidelity, in the true sense of the word, is the least of its merits. From the laws of optics, on which it is based, it must distort the lineaments, and it must vilify, alter, and burlesque all the colors. The blues of drapery it changes into patchy white, the scarlets into black, gold into white —in short, it renders nothing but black and white as they are.

Let a lady be dressed with the most exquisite artistic taste, her labor will be in vain the moment she exposes her looks to the "Peeping Tom" of photography. He will not tell the truth. He can't tell the truth; it isn't in him. The nose will be too long, or the mouth too large; or, if we get these, heaven have mercy on all the fairest of all things here below—lady's eyes! We must "focus" or get sharpness in the eyes, or the mouth, and either must suffer respectively in the rendering of the picture; there is no remedy whatever for the absence of the effects of the accessories to the complexion or the colors of drapery. Conventionally we accept these pictures as cheap treasures, but to the eye of taste they are always sad botches, and very much like a forlorn ghost of the originals. Some people fancy that we shall ultimately be able to get pictures in all their natural colors; but this is a delusion; the very nature of color and its production militates against the possibility of such an achievement.

It is said that M. Niepce de St. Victor has recently succeeded in rendering some of the colors in photographs; but it is admitted that they cannot be permanently fixed; if they could the accepted theory of colors must be rejected or modified.

We, therefore, recommend the ladies, when they go to be "taken," to avoid the very colors which may enhance their beauty to admiring eyes, but which will infallibly be laughed at—at all events, mocked—by the comical imp of photography.

It is impossible to lay down rules for the dress suitable to all complexions and features to undergo the trying ordeal of photography; but, as a general rule, the darker hues suit best, yet not so dark as to appear dead in the rendering. The fewer the colors the better, especially about the face, and the neutral tints are preferable In all cases to white.—*Mercury.*

Clips for Washing Prints.

In a recent number of the *British Journal*, p. 231, is an article on washing prints, the wedging them into grooves by means of lucifer match stems. I think I can suggest a simpler plan, and one less likely to tear the prints. Take two thin pieces of wood about three-quarters of an inch broad and three inches long, make a notch across the middle of the broad part, adjust them one on each side of a glass rod, slip an Indian rubber band on just below the rod, and you have a clip working on the rod. A number of these clips may be placed on rods to be laid across a washing-box such as I described in your last, the prints suspended therefrom. The lower part of the clips should taper to a point, so that the smallest possible portion may come in contact with the print.

The clips slipping up and down the rods may be made available for any prints without trouble.

The India-rubber bands are slices cut off vulcanised rubber tubing; the wood used was some laths from an old Venetian blind. Several dozens may be made in an hour; and, to persons residing in out-of-the-way districts, they will be found quite as convenient as the ordinary American clips. F. V. B.

—*Brit. Journ.*

You don't know what you can do till you Try.

The above apothegm was never more fully exemplified than in the following, which I send, thinking it may be interesting to some of your numerous readers.

On Friday last (unlucky day!) I had occasion to take a photographic view of a gentleman's residence, distanced about two miles from here. A friend, an amateur in the art, kindly offered his assistance. On our arrival at the gentleman's house an out-building was selected for a developing room, and my friend commenced unpacking; something fell to the ground. "Confound it!" exclaimed Mr. A, "it's the bottle of collodion!" Mr. A gathered up the fragments; "Hurrah!" he exclaimed, "it isn't all lost." Amidst innumerable bits of broken glass was about half an ounce of the precious liquid remaining at the bottom of the broken bottle, so he carefully laid a piece of paper over it to keep out the dust. I proposed returning for some more collodion, but was induced, reluctantly, just to please my friend, to try what he had saved. Now, owing to sundry preparations, such as making operating room perfectly dark, &c., &c., full three-quarters of an hour elapsed before I was ready to coat the first plate, size 8½ × 7, which part of the process required great care, to prevent bits of glass accompanying the collodion. I fully expected from the length of time it had been exposed to the atmosphere it would have rendered it useless, but the result was a most satisfactory picture. Another had to be taken from a different point of view, which turned out equally well; fully an hour and a half having elapsed from the breaking of the bottle to coating the last plate.

I remember in one of the recent numbers of the *News*, an article showing how indebted professional photographers were to amateurs, so I send you this as one instance more.

R. H. Dyball.

—*Photo. News.*

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Washing Glass.—One of the best plans is to soak the plates in weak acid till a short time before being wanted for use. When taken from the acid, wash under a tap, and set up to drain and dry in a warm place.

The Fuming Process.

Our apparatus for fuming consists of a common deal box, measuring eighteen inches each way, one of the sides being hung on hinges from the top, so that it falls as a shutter by its own weight. From the inner top of this box depend two or three strings five or six inches long, at the ends of which hang ordinary wooden clips. In the bottom of the box is placed a common plate. The paper being sensitised as usual, and thoroughly dried, is attached to the suspended clips by its diagonal corners, the sensitised side being outwards.

One drachm of concentrated ammonia is now poured over the plate in the bottom, a swinging motion is given to the suspended paper, and the door of the box is allowed to fall shut. We permit the paper to remain in the box ten minutes; and, generally, as we remove one series we are ready to introduce another, at the same time pouring more ammonia on the plate at the bottom. When the paper is removed from the fuming box, we allow it to lie on our table in our dark room a few moments, before we place it in the printing frame, in order to permit any uncombined ammonia to evaporate.

Other things being equal the results are that the paper prints quicker, the half-tones are more easily preserved, and it tones better. We believe, also, that a weaker sensitising bath may be employed with this process than can be safely used without it.

It is certainly more troublesome to fume the paper than to print it without fuming; but the extra labor is by no means so great as may be supposed. It is also very true that failures take place even when fuming has been employed. It is also possible to fume in so careless and irregular a manner as to do the paper more harm than good by it. But such considerations will have no weight with those who are satisfied with the general utility of the process. We fail occasionally, and we know that the fuming involves more labor, but we intend to continue to use the fuming process,—Ed. *Brit. Journ.*

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——Photographic paper is shortly to be made in the United States. Why not?

Counterfeiting a Photographic Portrait.

Tried before the Imperial Court of Paris, M. DEVINNE *presiding.*

THE question of the right of property in a photograph has now been, in this case, submitted to a civil tribunal, but with no more success than before the criminal court. This decision likewise declares that "in principle" photography cannot be protected by the law of 1793; but it proceeds to condemn the countrrfeiter because the photographic portrait had been retouched by hand. It is this erroneous idea, as it seems to us, which is permitted to govern the question. It is assumed that an original conception cannot create a work of art : the human hand must intervene to materialise it. If the thought, conception, or creation is obtained by means of a machine, then art is no longer possible ! Now, by applying this false principle to literature it could easily be demonstrated that Homer was no poet, because he never actually wrote either the *Iliad* or the *Odyssey.* The idea that a union both of the thought and hand which executes is absolutely necessary dominates over the notions of a great number of persons. We can but state the fact, and express our desire that France should not continue to occupy a lower position than England as to this important subject, but should pass a law for the protection of photography.

Here are the facts involved in the case before us :—MM. Duroni and Murer, photographers, executed in 1859, at Milan a portrait of Senator Ricasoli. This portrait was afterwards reduced by them to the form of a *carte de visite,* and patented and placed on sale. M. Prevot & Co. copied it by the aid of photography, and sold a number of the copies. Upon this a seizure took place. There was a trial, accompanied by a demand for damages, before the Third Chamber of the Civil Tribunal of the Seine, which repulsed the demands of MM. Duroni and Murer, and M. Saglier, for M. Prevot & Co., has rendered the following decision :—

" The Court considering that, if in general the production of a picture or a portrait by photography cannot be regarded as a work of art according to the law of July 13, 1793, it is otherwise when to the ordinary photograph is added the skill of an artist or any artistic combination. Considering, also, that MM. Duroni and Murer obtained the portrait of Senator Ricasoli, at Milan, in 1859, and published it with his authorisation; and that, besides, this portrait was reproduced by them and placed on sale, after it had received important re-touchings and modifications by the hands of an artist; and because it results from this that the copies sold are the product of photography and the art of designing combined; this fact places them under the protection of the law of 1793. Considering, as to damages, that the Court is in the possession of the means of determining them, but that a publication in the journals would be useless under the circumstances, therefore it decides to discharge MM. Duroni and Murer from the previous condemnation pronounced against them; the *carte* photograph is declared to be the exclusive property of MM. Duroni and Murer; M. Prevot & Co. are declared to be counterfeiters of the said *carte;* a confiscation of the property seized upon is ordered for the benefit of MM. Duroni and Durer; and M. Prevot & Co. are ordered to pay 300 francs damages, and all the costs.

"PERROT DE CHAUMEUX,
"Advocate of the Imperial Court."

—*Revue Photo.*

Signs of Improvement.

WE extract the following from a private letter of a correspondent at the West. The sentiment is too useful to the profession to be lost :—

"I suppose I am improving as fast as I ought to expect, but somehow I am not altogether satisfied; my actual performance does not begin to keep pace with my idea of pictures. I am not nearly as well satisfied with myself as I was a year ago, and yet when I compare my year-old pictures with those that I am now bringing into existance, I think I must have been an idiot last summer. My idea of perfection keeps advancing higher and higher and in practice I go creeping after, at a snail's pace in the distance, and that distance becoming greater, so that I often become faint at heart. It sometimes wears upon my physical strength so that I am obliged to give up work for days together. Do you understand how I feel? Is this the experience of every photographer."

Progress in knowledge surely begets modesty.

Editorial Department.

——The Photographical Society will commence its winter session on Monday evening, 10th inst., at the University. We learn that the committee appointed to search for a permanent location are prepared to recommend a place and a plan, which if accepted will materially improve the condition of the Society. The prospect now seems good that the Society will soon be able to put in order for exhibition its valuable collection of photographs and apparatus. All the members ought to attend this first meeting, and others interested in the art should remember that the meeting will be public, and that they will be cordially welcome.

——In our last issue we stated that the Internal Revenue department had decided that the stamp duty must cover the whole sum received for the photograph including its appurtenances. The following correspondence makes the whole matter as plain as a pike staff:—

Baltimore, July 28, 1864.

Hon Mr. Lewis, Commissioner of Internal Revenue.

Sir:—If the price of a photograph is five dollars, and the subsequent coloring or retouching five dollars additional, are stamps to be used for the photographs alone, or for the whole amount—ten dollars? If we color or retouch a photograph taken elsewhere, is it necessary to use stamps for amount of work done.

Yours truly, Bendann Bros.

Treasury Department, Office of Internal Revenue.
Washington, July 29, 1864.

Gentlemen:—In reply to your letter of the 28th inst. I have to say, that the photograph, or other picture embraced by the law, must be stamped according to the full value of the picture, the frame, the coloring, and any other trimming that may be added. The stamp or stamps must correspond to the price charged for the *whole*, and not for the picture alone.

Where you color or retouch pictures, you must stamp such retouched pictures in accordance with the price you charge for your labor and materials, that is to say, the charge to your customer must constitute the basis of stamp duty.

Enclosed is a copy of Schedule C, showing the rates of taxation.

Very respectfully, E. A. Rollins.
Deputy Commissioner.

Messrs Bendann Bros., Baltimore, Md.

——Mr. D. R. Hoag, of the firm of Hoag & Quick, of Cincinnati, after a short illness, died on the 17th ult. He was widely known as a courteous and intelligent gentleman, and a sucessful photographer. He has been for a long time a man of mark in our profession.

——We have been requested to state that Messrs. Willmer and Rogers, 47 Nassau street, are authorised agents for the *British Journal of Photography*.

Minor Correspondence.

CARTHAGE, of N. Y.—"What is your opinion of bichloride of platinum for toning photographs? where can I get it, and what is the cost of it? Also, your opinion on auro-calcio-chloride of gold; has it any advantage over chloride of gold, or is it cheaper or better? Can I get Divine's collodion of you, and what is the cost per pound?" ....Chloride of platinum is said to be useful when mixed with the ordinary gold toning baths; we have not tried it. Fifty cents for 15 grs. of chloride of platinum would be a fair rate; you can get it of any of the New York dealers. It is our opinion that all the standard toning solutions which have gold as a basis are about equally meritorious; all may be made to produce the same results at the same cost of the precious metal. All that is needed is a weak solution of chloride of gold made neutral or slightly alkaline by *any* alkali. "Calcio-chloride" is all very well, but cheaper or better we think it is not. ....For Divine's collodion see advertisement. The price is $2 per pound.

E. E., of N. Y.—"Is it a principle that a negative which is to be varnished must be strengthened in order to maintain its intensity? or is there a way of varnishing which does not require strengthening before varnishing?" ......Varnishes differ somewhat in their effect of lowering intensity. If the plate be first treated with gum water, and dried, the intensity is less affected by the varnish.

S. W. W., of Pa.—"Can you, through your Journal, tell me the reason that in forming silver solution for paper by the use of nitrate of soda there is such a great quantity of precipitate, and if it should be taken up. I attempted to make it and thought I was wrong in the manner I mixed it." ....Pure nitrate of soda makes no precipitate with nitrate of silver. You have either used very impure nitrate of soda, or some other chemical has been given you in place of it.

G. W. B., of Kansas.—"I cannot succeed in making good whites in my ambrotypes. What is the cause? The bath is in superior working condition; in fact I have used several different baths, and all with the same result. I do not think the fault is in the bath, unless it is for the want of iodide of potassium. The collodion used is an old stock bought of different dealers and from different manufacturers, in March last, most of which is of a light lemon color, though the one from the specimen inclosed is quite red." ....The most important conditions for producing good whites are, a new bath acidified with nitric acid, an old and thin collodion, a developer containiing some nitric acid, and fresh cyanide fixing. We are inclined to think that when these conditions are in sufficient, the gun-cotton of the collodion is at fault.

D. E. R., of N. Y.—"Please to put in your next issue of the Journal a reliable receipt for the phosphate of soda toning bath." ....Water, 1 quart; chloride of gold, 5 grains; phosphate of soda, 20 grains. If the mixture is acid, neutralize with bicarbonate of soda. ....You will please excuse us for omitting to answer your other enquiry. If you want the information for your own use we will give it to you by letter.

R. M. S., (a lady) asks if photography is engaged in, as a business, by any women. We answer, Yes; scores of them. It is a business well suited to the tastes and capabilities of women. In a letter before us, referring to one of our lady subscribers, the writer says, Mrs. ——— is an artist of respectable capacity; although she is over sixty years of age she is not excelled in these parts in ambrotypes.

W. M., of D. C.—"I have a beer barrel with a plug about four inches from the bottom to catch the waste from my sink; nothing dirty goes into it except washings from dishes, pictures, and developer; there is a lot of stuff at the bottom which looks like mud; what shall I do with it?" ......Your contrivance is a poor one for saving silver. Please read our editorial of Sept. 1. Take out the 'mud,' dry it, and send it to a refiner.

THE AMERICAN
Journal of Photography.
[NEW SERIES.]
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On the Use of Methylated Spirit in Photography.

BY J. NICOL.

In a former paper I tried to show that methylated spirit, and ether made from it, might safely be used in the manufacture of collodion, and that the charges so frequently brought against those preparations had their foundation—not in any injurious effect produced by the pyroxylic spirit added to the alcohol, but in the fusel oil and other impurities contained in the spirit selected by rectifiers for the purpose of methylating.

The principal consumers of methylated spirit are the varnish makers, and they only require that it be strong and cheap; but when the manufacturers of photographic preparations shall have become converts to the views which I hold in this matter, and demand the additional element of *purity*, rectifiers will use *rectified* spirit for methylating, and so supply a suitable article at an advance of probably less than ten per cent. on the present price.

In consequence of certain subsequent correspondence, and especially by some observations by one of the present Editors of *The British Journal of Photography*, I was induced to undertake a more exhaustive series of experiments, for the purpose of strengthening the opinion advanced in my previous paper, and, if possible so to settle the question as to restore to favor the much-abused methylated preparations. My object now is to record the result of those experiments, and recommend the matter to the attention of my brethren of the camera, who would gladly see their accounts for chemicals reduced without a corresponding curtailment of the supplies.

I began operations, early in March, by taking a gallon of *pure* rectified spirits of wine and adding to it the proper quantity of the so-called naptha, which I procured from a maker who supplies it to the Government for the purpose. On mixing the liquids a slight milkiness was produced, which disappeared by filtration. With part of the methylated spirit so made I prepared three pints of a tolerably good ether, and from that and part of the remaining spirit I made four pints of collodion, three of which were bromo-iodised, and one simply iodised. A fresh bath of one hundred ounces, very slightly acidulated with nitric acid completed the preparation; and after exposing and developing a few wet collodion plates to see that all was in good working order, the experiments were commenced, from the daily record of which the following particulars have been extracted :—

During March thirteen dozen dry plates, varying in size from 3¼ inches to 9 × 11 (about three square feet) were prepared. About one-third of these I exposed and developed myself with *pyrogallic acid*, and, making allowance for the usual amount of failures from ordinary causes in working dry plates, the results were very good. The other two-thirds were sent to Spain, and I have not yet had information regarding them.

In April, eight dozen (about forty square feet) of dry plates, and six dozen (about eight feet) wet collodion, were sensitised in the bath; of the latter about one-half were developed with iron, the other with pyrogallic acid. Two dozen and nine were varnished and printed from; the remaining three dozen and three were failures from improper exposure, accidental injury, or other of the numerous sources of failure that we are all so well acquainted with; but on not one was there the slightest trace of fog, or anything traceable to a faulty bath. Of the dry plates only one dozen were developed by myself : the result was fair. The rest were sent in various directions over the country.

In May, twelve dozen (about forty-eight square feet) were experimented upon, about one-third of that quantity being worked by the wet process and developed both with pyrogallic acid and iron, with very fair results; the remaining two-thirds were dry, and sent to various persons both in Scotland and England, and reported on as being first-rate plates.

In the bath thus experimented with for three months, I prepared one dry plate (tannin), and exposed it on one of the trees in my garden, and at the same time sensitised two wet plates : one I developed with iron, the other with pyrogallic acid. The negatives I shall exhibit at the next meeting of the Edinburgh Photographic Society, and prints from them are in the hands of the Editors of *The British Journal of Photography*, who, I have no doubt, will bear testimony to the condition of the bath, so far as that can be ascertained from really brilliant, good pictures.

During the three months over which the experiments extended, thirty-nine dozen plates (about one hundred and twenty-seven square feet of glass), coated with nearly five pints of collodion made from ether and alcohol, both methylated, have been sensitised in the bath, and developed, some with pyrogallic acid, and some with iron, giving, so far as the bath was concerned, from first to last uniformly good results.

On examining the bath it has the smell peculiar to one that has been used for some time, but certainly not more so than if pure spirit only had been used. Its bulk is reduced by thirteen ounces and the strength to thirty-two grains; but, as on two occasions, on the appearance of pinholes, I added half an ounce of silver, the quantity actually taken up by decomposition may be stated in round numbers at eight grains per ounce, which would have brought the bath down to twenty-seven grains.

On the whole, then, I think that from those experiments I am justified in saying, as I did in my former paper, that methylated spirit may be used in the manufacture of photographic preparations with perfect safety, and from the large trade which the manufacture of photographic chemicals has now become, and the still large future which is before it, I am certain that if methylaters would take my advice and methylate a rectified spirit for photographic purposes, it would pay them well.

But photographers, to whom economy is an object, need not wait till the eyes of methylaters are opened. Whoever has a small still (the common tin one used for distilling water will do admirably) may make for himself a capital spirit from the ordinary commercial article. Into a large bottle put half-a-gallon of the ordinary methylated spirit, four ounces of a freshly-burnt animal charcoal, and four ounces fused chloride of calcium; let the whole stand for twenty-four hours, shaking occasionally. Filter into the still, and draw over three pints and a-half. This will give a spirit pure enough to be used in the most delicate photographic operations.

During June and July I have been working with collodion made from spirt prepared in this way, and sensitising in the afore-mentioned bath; and making due allowance for one's partiality to his own creations, I think I may say that my pictures have been about as good as my neighbors', and certainly quite as good as any I ever got from *pure material.* One picture, taken a fortnight ago, is also in the hands of the Editors. It was "wet," developed with pyrogallic acid, and speaks for itself.

[The above important communication from Mr. Nicol somewhat staggers us in our oft-expressed conviction of the injurious effects of methyl in collodion. Perhaps, after all, Mr. Nicol may be right in his assumption that it is the fusel oil which is the injurious ingredient. Our own experiments in this direction were made from the most highly rectified samples we could purchase from the best makers, and the result of many comparative trials left no doubt on our minds that methyl was decidedly injurious. We did not test for fusel oil, and, therefore, in consequence of Mr. Nicol's suggestion, we shall take an early opportunity of going over the ground again. The print forwarded by Mr. Nicol is one of the most perfect we have seen, and must have been produced from a negative possessing every good quality that a negative should possess.] —Eds. *Brit. Journn.*

Influence of Iodide of Silver on the Silver Bath.

BY DR. H. VOGEL.

I HAVE examined several silver baths in order to ascertain the relative quantity of iodide of silver they contain. A bath saturated with iodide of silver and composed of $\frac{35}{100}$ parts of nitrate of silver to 100 parts of water contained in 10-drms., 0.077-drms. of iodide of silver; another of 9$\frac{94}{100}$ per cent. contained at a temperature of 60° Fah., 0.057 drms. of iodide of silver; a third of 10 per cent., and at a temperature of 61° Fah., contained 0.053 of iodide of silver.

I ascertained that iodide of silver is more soluble in cold silver solutions than in warm ones; on this account solutions nearly at the point of saturation, and when heated, become turbid, and those which are quite saturated show evidences of turbidity from the warmth of the hand when held in a test glass. The solubility is materially increased by the alcohol it contains; a solution already saturated will bear the addition of one-third to one-half its volume without any turbidity being produced; whereas a single drop would produce this result.

On this account old baths contain much larger quantities of iodide of silver than those which have been recently saturated with it. In 100-drms. of an old bath containing $8\frac{85}{100}$ per cent. of nitrate of silver were found 0.05-drms. of iodide of silver; in another of $11\frac{4}{100}$ per cent. of nitrate of silver were found 0.085 of iodide of silver.

These experiments show distinctly the importance of keeping the bath cool in summer, and of maintaining it ot a temperature of about 60° Fah.—*Photo. Notes.*

Formula for a Collodion which is Fit for Use very Soon After its Preparation.

BY PROF. OGDEN N. ROOD.

THE immense number of formulæ for sensitising collodion which have been published must be perplexing to those taking up for the first time the practical study of photography. After experimenting on a large these, I have for the last two years settled down to the usee of two only, which I constantly employ, finding that I can always rely upon them. One of these is more generally useful than the other, as the collodion thus prepared is fit for use in from twelve to twenty-four hours, and still retains a fair degree of sensitiveness for several weeks.

With this collodion I have taken many instantaneous photographs on the sea coast, the exposure in some cases being reduced to one-twentieth of a second. A Jamin portrait combination was used of six inches focal length, the aperture being reduced to seven-tenths of an inch. The plates had to be carried some distance, so that often twenty minutes elapsed between taking them from the bath and development.

The collodion was made from gun-cotton that had been slightly disintegrated, and sensitised thus :—

Plain collodion	8 ounces,
Iodide of cadmium	40 to 50 grains,
Bromide of ammonium	6 to 12 “

the latter being dissolved in alcohol, or in a very small amount of water, and then added to the plain collodion.

This formula has, in my hands, given better results *soon after the sensitising* than any that I have tried.—*Brit. Journ.*

On Albumenised Paper.

BY JULIUS SCHNAUSS, PH. D.

It cannot be denied that albumenised paper has contributed largely to the present perfection of photography. Formerly it was rejected by portraitists because it was asserted that the great brilliancy gave an inartistic effect to the picture. Now, on the contrary, it is rare to see such a thing as a photograph on plain paper. The delicacy, vigor, and brilliancy of the image is wonderfully heightened by albumen, and the negative does not require excessive intensifying in order to yield good proofs, provided only that it is evenly developed. Formerly the practical photographer trusted too much to touching up; and many an imperfect negative was allowed to pass muster with the help of good touching, and it was even the practice in many studios to stop out the backgrounds and produce artificial ones. Also, when it was made use of, more or less broad white lines appeared around the figure. With a print on albumenised paper, on the other hand, there are difficulties in the way of touching up. Not only were all the delicate gradations of tone in mixing the colors more difficult to obtain than with ordinary salted paper, but also the dulness of the touched parts disturbed the general effect of the print; and further, there is an obstacle presented by the difficulty of making ordinary colors cling to the albumenised surface.

The coloring of albumen prints has recently made great progress and there is scarcely anything that causes a more favorable impression than a delicately-colored albumen print, with good *chiar oscuro.* The manner of coloring is kept secret by many photographers; there are, however, some formulæ by which a greater or less degree of success may be obtained in touching and coloring prints on albumenised paper.

One—perhaps least worthy of recommendation—consists in roughening the print with an ink eraser, *i.e.*, a compound of India-rubber and sand, then coloring and coating with varnish.

It appears to us better first to coat the whole print or merely those portions of it that are to be touched up with any substance that will cause the water-colors to adhere, and also to rub down the colors with some of the same substance. The best known of such adhesive bodies are—honey, or any solution of syrup, gum arabic, and ox gall. Simply damping the print with water, and subsequently wiping it gently off, will facilitate the application of the colors, and if with the colors a small quantity of gum arabic is mixed, no trace of the touching will be visible, provided, of course, that it has been carefully executed and the colors properly mixed. The addition of a little carbonate of soda to the water makes the re-touching still easier, but the alkalinity of the salt affect some colors too much. My own experience goes to show that the simplest method of coloring albumenised prints is this :—First cover the entire print with fresh ox gall, by means of a small sponge or broad brush; then color it in the usual way with water colors; and, finally, coat it, when perfcetly dry, with any good transparent spirit varnish. The latter is indispensable, since without it the colors appear dull.

Our readers have recently been informed of a method of making the albumenised prints transparent with a varnish and coloring on them, with oil colors on the reverse. This method after a little practice, produces, even without artistic talent, very fine effects, if the colors are chosen with taste, and applied with cleanliness and not too thickly. It is better to frame a print so prepared at once and on a white ground, since it is difficult to mount them smoothly on cardboard with aqueous adhesive bodies. such as gum, paste, or glue. Possibly a transparent solution of caoutchouc in benzine might be employed; but I have not tried it, and it might perhaps dissolve the oil colors.

Albumenised paper causes the photographer even more trouble in toning than in coloring and re-touching. The worst trouble is mottling; for, if once present in the paper, there is no means of warding it off. The thicker the paper and the more strongly albumenised, so much the more likely is it to make its appearance. A thin paper, evenly and not too strongly albumenised, shows no mottling, and tones much more easily. In the parts, for instance at the edge of the paper, where there is sometimes too little, sometimes too much albumen present, it will be clearly perceptible that in the former case such places tone much quicker, and become bluish-grey, while the rest of the print is still brown; whereas, in the latter case, they remain much redder, and in spite of prolonged toning appear as red, and oftentimes very large, spots and streaks. It may generally be noticed that at such red places the water, and consequently also the gold and silver in the respective baths, are repelled, whilst the whole of the remaining surface keeps wet—a circumstance which fully explains the red color of those places. That which takes place here on a large scale appears to occur with the mottling in small spots, almost regularly spread over the whole picture, and which on that account remained red. Is it possibly a result of the texture of the plain paper that more albumen is collected in its hollows than in the other parts, and that hence the former remain redder in the toning bath? Microscopic examination of a similar paper induced Herr Liesegang to form this supposition. Setting out with the opinion that the repulsion of the baths at such places is the original cause, and that the mottling already begins to form in the silver bath, we should endeavor to find a means of overcoming this repulsion, and so obtain a regular moistening. Perhaps the addition of alcohol to the albumen bath, and a bath of diluted alcohol before toning, wonld be of use. At any rate, in many instances in which I have worked with paper inclined to mottle, the evil has been remedied thereby.

A good toning paper free from mottling, and yet sufficiently strongly albumenised, is a very valuable acquisition to the photographer; and he should, therefore, not mind paying rather more dearly for it than usual.

If the operator should have the misfortune to be compelled to work with paper addicted to mottling, he may partly remedy the evil by strong silver baths, five minutes floating, deep printing from vigorous negatives, thorough washing with distilled water before toning, and slow and not excessive toning in a somewhat diluted gold bath.

On the Action of Light upon the Chloride, Bromide, and Iodide of Silver.

BY HERMANN VOGEL.

The following propositions embrace the results which have been obtained :—

1. Light communicates to the iodide, bromide, and chloride of silver the power of attracting and retaining the nascent particles of silver.

2. Placed in identical circumstances, the iodide of silver acquires this power first, the bromide next, and then the chloride. The iodide of silver, having been exposed to the influence of sunlight, acquires, under the action of a developer, a dark grey color, the bromide a brownish grey, and the chloride a brownish yellow.

3. This action of light is not in proportion to its chemical activity; for

(a) It manifests itself with a maximum influence upon the iodide of silver, which undergoes no change appreciable by sight, and with a minimum influence upon the chloride of the same metal, of which chemical decomposition is the most apparent.

(b) In the presence of the bromide of silver chemically decomposable, the photographic influence of light passes its maximum, and tends to decrease before the chemical action begins to be appreciable, by means of starched iodised paper.

Besides, with the chloride and bromide of silver, the chemical change of color does not advance equally with the photographic change of tint; for the first continues to augment when the last has passed its maximum and begins to decrease.

4. Ordinary paper immersed in a solution of nitrate of silver, and then carefully washed, retains a certain proportion of the

compound, assumes a brownish color under the action of light, and is feebly sensible to the photographic action—that is to say, discolors faintly under the action of a developer.

5. The nitrate of silver increases the photographic sensitiveness of the chloride bromide, and iodide of silver; but the sensibility of the three salts, as compared with each other, remains the same—that is, the iodide is the most sensitive, and the chloride is the least so. The bromide shows in the highest degree the photochemical faculty—*i.e.*, the property of darkening under the influence of light by contact with the nitrate of silver.

6. Humidity has no appreciable influence on the photographic sensitiveness of the haloid salts of silver, when they are in a state of purity.

7. Acids diminish or destroy the sensitiveness of the iodide and of the bromide of silver as well during as after the exposure to light. Nitric acid acts with the most energy; acetic acid acts but feebly.

8. The iodide of potassium destroys completely the sensitiveness of the iodide of silver, both during and after the exposure to light.

9. The mixture of iodide and bromide of silver is more sensitive than pure iodide of silver; that is, under similar conditions of exposure and development the mixture darkens the most under the action of developers. A mixture of the chloride and iodide of silver acts in the same manner. In general, all the salts of silver which may be chemically decomposed by light seem to exalt the sensitiveness of the oxide of silver when they are mixed with it.

10. The photographic action of light upon haloid salts of silver increases very rapidly up to a certain point, and then slowly diminishes (solarisation).

11. As this increase and decrease is simultaneous for the iodide and the bromide of silver, I conclude that for these two compounds the maximum photographic action is attained at the same point.

12. The time which light requires to exert its maximum photographic action depends upon its intensity. The greater the intensity the shorter the time. To attain this photographic maximum I consider it very probable there should always be, between the time of the exposure and the intensity of the light, a definite and uniform relation.—*Pogg. Annalen.*

Toovey's Patent Photolithographic Process.

[The fact that a medal was awarded to Mr. William Toovey, of Brussels, for the best photolithograph in the late exhibition of the Photographic Society, renders it desirable that we place before our readers so much of the details of the process by which the pictures in question were produced, as it is possible to procure. This will best be done by the following extract from his specification, which is dated June 23, 1863, and sealed December 17, 1863, for "Improvements in Photolithography, Photozincography, and Photographic Engraving on Copper or Steel Plates, or any other Suitable Substances."—Eds. *Brit. Journ.*]

In order to produce on a lithographic stone an impression suitable to be printed from I proceed as follows:—From a negative on glass or paper a positive impression is taken on paper prepared in the following way: I take sized paper very smooth and even in texture, which I coat with a solution of gum arabic in pure water saturated with bichromate of potash; it is known that bichromate of potash, in combination with an organic substance such as gum, gelatine and starch, becomes insoluble in water after a certain exposure to light. The paper prepared as above I then expose to light behind a negative, and when the photographic image is sufficiently developed, such parts of the gum impregnated with bichromate of potash which receive the rays of light become insoluble, or partly so, exactly according to the gradation of tone in the negative employed. The sheet of prepared paper with the photographic image thus printed I place face downwards on a lithographic stone, grained very fine or polished according to the nature of the image to be reproduced, and previously arranged in a percussion press (it can be done in a lithographic press, but the result is uncertain). I then place several sheets of damped paper upon the stone over the photographic proof, and apply a heavy pressure; the water contained in the damp paper is pressed through the photographic proof, and dissolves the parts of gum remaining at liberty; the dissolved gum attaches itself to the surface of the stone. When the stone has remained a certain length of time in the press, sufficient to allow the small quantity of soluble gum in the dark shadows to attach itself to the surface of the stone, I remove the pressure, and withdraw the photographic proof carefully from the stone; a negative image is then visible in gum on the stone, with all the gradations of tone. I then dry the stone, either spontaneously or by gently warming it; when well dried I cover the whole surface of the stone with greasy ink, which may be applied with a roller or otherwise; the greasy ink is thus brought into contact with all the parts of the stone untouched by gum; the coating of ink is then removed by passing through the lithographic press, by spirits of turpentine or otherwise, and all the gum removed from the surface by washing. The stone is then rolled in with ordinary printing ink, and the positive image appears in black; it is then printed as every lithographic drawing, but has the great peculiarity of requiring no etching, the gum having so far penetrated by pressure into the substance of the stone as to allow of a great number of impressions being taken off. I prefer gum arabic, but similar substances can be used instead, such as gelatine, dextrine, and mucilagenous solutions.

In photozincography, I proceed as above described, substituting a zinc plate for a lithographic stone.

In photographic engraving on copper, steel, or other metal plates, the preliminary operations are the same as those I employ for stone or zinc, excepting that a positive image on glass or paper should in the first instance be used instead of a negative. When the plate is withdrawn from the press and the photographic proof detached from it, it should be well dried, for the stone. The plate is then covered with a thin coating of varnish. and when dry may be soaked in water to remove the gum, or immediately plunged in a weak solution of acid and etched in the usual way of etching on steel or copper. Wherever the plate is protected from the varnish by the gum it will be attacked by the acid, and an engraving is produced, which is then printed as an ordinary etching on metal plate.

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——M. Blondeau has just made the important discovery that when gun-cotton is exposed for some days to the action of ammonia in the gaseous form, the latter is absorbed to a very considerable extent, and a new compound, to which he has given the name of *cellulo-nitric-triamide*, is developed.

Photography Without a Nitrate of Silver Bath.

The *British Journal of Photography* of the 29th July contained a lamentation concerning various photographic ailments which Mr. Rejlander had experienced during a recent tour in the south of England. The cry of complaint also included an anxious and earnest appeal for the discovery of a process which might be worked without the nitrate of silver bath.

We have experimented with a view to this end, and are delighted to find our efforts resulting in a success far surpassing what our best hopes could have anticipated,

As we do not intend to add another fetter to the advance of our fascinating art-science in the shape of a photographic patent—even were such abominations indisputable—we hasten to publish the formula which has produced good and perfect negatives upon plates prepared with such simplicity of manipulation and economy of labor, time, and expense, that no former process has ever surpassed.

Without entering into the preliminary investigations which led to this discovery, the secret of the whole consists in converting simply bromised collodion into what we will for convenience designate "collodio-bromide of silver," by the addition of the combining equivalent of nitrate of silver to the previously bromised collodion.

To reduce this to practice we prepared bromised collodion as follows :—

Alcohol	½ ounce.
Bromide of cadmium and ammonium	3 grains.
Pyroxyline	2 "
Ether	½ ounce.

Well filtered.

We then took an ounce phial, placed therein four grains of pulverised nitrate of silver, which we dissolved in two drops of distilled water; then covered the bottle with a perfectly non-actinic coating of brown paper, and in a *yellow light* added the ounce of bromised collodion. The mixture at once produced mealiness, which does not disappear; we then shook the bottle, and coated a clean glass—previously tipped at the edges with benzine and India-rubber solution—with the collodion, *without even allowing it to settle*, and allowed the film to set in the ordinary manner; then place the plate, face upwards, in a dish of water, and when the greasy appearance vanished, rinsed under the tap for a few seconds; then poured over the film the ordinary fifteen-grain solution of tannin, worked it well into the film for about one minute, drained, wiped the back with blotting-paper, and dried rapidly in a kitchen oven.

This plate was exposed the following day for thirty seconds using a Ross's four inches and a-half focus single lens, smallest diaphragm, say three-sixteenths of an inch. Result : details in full, and sufficiently dense to print, the negative *perfectly clean*, free from pinholes, comets, spots—in fact, everything was absent that has ever tended to harass and perplex our photographic existence.

Another plate similarly prepared the same evening, and exposed about half a minute after the first for fifteen seconds was ONLY slightly under-exposed. The development was as follows:—We placed the plate, film upwards, in a dish of water; when equally moistened we poured over it the following solution :—

Water	1 ounce.
Carbonate of ammonia	3 grains.

to which had been added a few drops of the alcoholic solution of pyrogallic acid, viz., ninety-six grains of the former to one ounce of the latter.

Development commenced at once; but owing to the extremely blue transparency and thinness of the film, one or two minutes passed before the details were distinctly visible, when a piece of white paper was placed underneath. At this stage the plate was thoroughly washed, afterwards, in order to neutralise the alkali, rinsed with a little very dilute acetic acid; and then intensified in the ordinary manner, using the following solution for that purpose :—

No. 1 SOLUTION.

Pyrogallic acid	1⅓ grain.
Citric acid	1 "
Distilled water	1 ounce.

No. 2 Solution.

Nitrate of silver	30 grains.
Distilled water	1 ounce.

To two drachms No. 1 add two or three drops of No. 2.

The negative rapidly acquired density. When sufficiently dense it was washed and fixed with a saturated solution of hyposulphite of soda, then washed *thoroughly* and dried. It yielded a good print. A wet collodion plate under the same circumstances would have required about ten seconds. Twenty seconds would probably have sufficed in our case.

Several modifications of the above process have occurred to us, the experiments connected with which we are now following up. We purpose making the film more opalescent,, and have hopes of accelerating the exposure so as to equal in rapidity that of bromised or wet collodion.

As far as we can judge from our short experience, the process is singularly free from the risks that have hitherto beset dry-plate photography, and the easy manipulation equals, at least, that of the wet process. One dozen stereoscopic plates may be prepared by one person in half-an-hour—exclusive of cleaning the glasses.

We are not in a position to say whether the collodion deteriorates by prolonged keeping. We know that hitherto we have found no loss in sensitiveness; but, of course, it must be kept in the dark. A bottle in a wooden case, such as those sold by druggists, is very suitable for the purpose. It had better be painted over with black varnish, and covered with yellow or brown paper.

Having regard to the chemical equivalents in the formation of bromide of silver, the weight of the bromide salts and of the nitrate of silver may be extended at discretion, as also of the pyroxyline, but it will be found desirable not to have the collodion too thick. Excess of bromide produces insensitiveness.

No doubt many experimenters will at once give the subject their attention, and aid us by the publication of their observations. We hope to have further improvements to communicate next week, or very shortly.

B. J. Sayce.
W. B. Bolton.

Liverpool, Sept. 3rd, 1864.

Curious Effect of Chlorate of Potash in the Developer.—A New Intensifier.

BY JOHN LAMB.

I HAVE for some time been experimenting with various highly oxydising agents, as sensitisers and developers, with a view to shorten the exposure in the camera. Amongst others I found a peculiar effect produced by chlorate of potash. The picture was first developed with iron (and not brought too far out), well washed, fixed, redipped in the nitrate bath, drained, and a few drops of a saturated solution of chlorate of potash added to an *acid* solution of pyrogallic acid (of the usual strength) which was then poured over the plate. The picture changed from a silvery white positive to a grey by reflected light, and a beautiful *positive* by transmitted light, with intensely black shadows, like the Ferrier transparencies. These pictures may be used as transparencies, or transferred from the glass by any of the known processes, to albumenised or gummed paper, and used as positives. A few drops of a saturated solution of chlorate of potash added to the nitrate bath seems to be an improvement. It appeared to me to increase its sensitiveness, while the pictures had more harmony in light and shadow than without it. Another peculiarity of this combination of pyrogallic acid and potash is, that if the two are mixed together in dry powder in certain proportions, a very explosive compound is produced, which ignites at a very low temperature. I find that the explosive properties can be increased by the addition of other oxydising agents, which are not in themselves explosive, but have the effect of violently disturbing the feeble combinations of the others. I intend continuing my experiments in this direction, and, as your Journal is devoted to science as well as photography, I shall let you know the result.

The following is a new intensifier which might be worthy of a trial from the profession:—In a test tube dissolve a *small* quantity of hyposulphite of soda, in another the same proportion of sulphate of copper. Mix the solutions together, and add just as much nitric acid as will *clear* the solution (one drop should be enough). This is poured over the picture after it has been fixed and well washed

A yellow deposit falls upon all the lights, which may be increased to any extent; even a thin positive may be made dense enough to print from. I have not had sufficiently long experience with this intensifier to enable me to say whether the yellow deposit fades in the light, as the iodide of mercury does; but, from what I have seen, I am disposed to think it does not. I may mention that the nitric acid plays a very important part; without it no deposit takes place, and if too much is added it loosens the film from the glass.—*Brit. Journ.*

Films Dissolving When Varnished.

We have received many complaints of the frequency of this annoyance of late. The circumstance which makes it most annoying is the fact, that the peculiar class of collodion which yields such films is often that which gives the finest negatives, and the photographer stands aghast at witnessing some especially fine picture break up, run into streaks, and disappear before his eyes. Our readers are aware of the usual remedies, such as avoiding the use of a spirit varnish, using instead those in which benzole or chloroform are the solvent, or the coating of the plate before drying with dilute gum water or albumen. There are certain objections it is true, to the remedies : chloroform, or benzole varnish, rarely afford as perfect a protection to the film, being less hard than spirit varnishes; and gum water, besides being troublesome, having sometimes a tendency to flake off. Albumen is, perhaps, the best application for the purpose.

We have, however, one or two other suggestions to make. Carefully avoid a spirit varnish which smells of wood naptha, as this substance being a ready solvent for pyroxyline, is almost certain to dissolve the film; and being a good solvent for resins, and cheap, it is much used in the manufacture of the commoner class of spirit varnishes.

Perhaps the best suggestion we have to make on the subject is one recently communicated to us by Mr. Spiller. In the photographic department at the Royal Arsenal, Woolwich, several negatives had recently been lost on varnishing; the sample of collodion in use, although very excellent in other respects, was of that quality which readily dissolved in strong alcohol, especially by the aid of heat. After trying various plans to surmount the difficulty, it was finally discovered that if the varnish were applied to the film quite cold, no solution took place; but the varnish was, of course "chilled," and dried grey and opaque. The alcohol being evaporated, however, the plate was next held to the fire, and the layer of gum resin which covered the plate as a dead grey film, now melted, and gave a clear transparent varnish, without the slightest risk to the collodion film, or the image. Sometimes the film of varnish will look a little less brilliant than if it had been applied with heat in the usual way; but this makes no practical difference in the printing.—*Photo. News.*

Contributions towards the Foundation of a Quantitative Photography.

BY PROFESSOR ROSCOE, F.R.S.,

[Abstract of a paper read before the British Association, Sept. 20th, 1864.]

After remarking that the theory of photographic processes was, up to the present moment, in the first quantitative stage, Professor Roscoe proceeded to describe some of the results of experiments undertaken for the establishment of a quantitative photography; the method being based upon the experimental law laid down by Professor Bunsen and the lecturer, to the effect that a constant product of the intensities of the acting light into the times of exposure correspond to a constant tint on the photographic paper. If several prepared papers were exposed to a constant source of light for varying times, in order that they should all exhibit the same tint when examined by the soda flame, the relative sensitiveness of the papers would be represented by the reciprocals of the said times. To overcome the difficulty of exposing papers of varying sensitiveness for different times, until a uniform tint was obtained, the papers were all exposed the same length of time, and the different tints produced, read off upon a graduated standard strip prepared in the pendulum photometer, and the time calculated which each paper must have been exposed in order to bring them all to one tint taken as the standard.

It had been previously ascsrtained that variation, between certain limits in the strength of the silver bath but slightly affected the sensitiveness, but that the strength of the salting solution had a most important influence in this direction. Papers prepared with varying proportions of chloride of sodium, and then excited on a ten per cent. silver bath, and their degrees of sensitiveness recorded, that salted with a one per cent. solution being taken as the unit, and curves drawn indicating the relative sensitiveness of each of the other papers. A carefully tabulated statement of the progressive increase of sensitiveness, with each increase in the strength of the salting solution was then secured. The experiments were tried with the chlorides of sodium, potassium, and ammonium, but no variation in sensitiveness was found to arise from the use of the different metals, when the quantity of chlorine remained constant.

Experiments with iodides and bromides were also recorded, the former, however, even after long exposure, was not sufficiently affected to admit of satisfactory measurement of its sensitiveness notwithstanding that in the formation of a latent image it is so much more sensitive than the other haloid salts of silver. Bromide of silver was found to be considerably more sensitive than chloride, and a mixture of bromide and chloride were found as sensitive as the bromide alone. A mixture of iodide and chloride was found to give a great accession of sensitiveness and a mixture of equal parts of the three salts, chloride, bromide, and iodide, gave still more sensitive results. With a mixture of bromide and iodide a remarkable decrease in sensitiveness was observed, the retarding action exerted by iodide being analogous to the retarding action exerted by the traces of small quantities of foreign gases upon the sensitive mixture of chlorine and hydrogen; and probably belongs to that class of action to which the name of photo-chemical induction hrs been given.

The details of these interesting experiments will appear in our pages, when Professor Roscoe has completed and verified the results.

Professor Roscoe also read a paper on a chemical photometer for meteorological observation, and gave several of the results observed. The principle involved is the same as that upon which the quantitative estimate of photography is based.

Theo. T. Axe's "Valuable Formulas."

Mr. Axe it appears has sent to photographers, by mail, circulars in which he promises on the receipt of "the small sum of one dollar," to forward in exchange valuable formulas which have been and are selling at prices varying from $5 to $25. The circular continues by particularizing the various useful secrets which are to be imparted.

The circular closes by referring to certain parties in this city, among whom is the Editor of this Journal. It is hardly necessary to assure our readers, that this use of our name is wholly without authority from us.

Mr. Axe, like all those who engage in the old process peddling, in performance scarcely keeps faith with his promises. Indeed his case is simply a repetition of the old story. The well-known and approved processes of our manuals and journals are presented in a different kind of English. Mr. Axe however observes the ordinary rules of grammar so well that the familiar processes are but thinly disguised; he is evidently a man of better education than those of the stamp of Professor Silver.

The "Valuable Formulas" are printed on two pages of a letter sheet, and are introduced to the hopeful reader by the following words :—Sir : These formulas have been tested, and are sold as secrets for from $5 to $25 each." As a fair specimen of the contents of the paper, we extract complete the directions for saving silver.

"For Saving Silver from Washings, Filters, Clippings and Solutions.—Every artist knows that from 50 to 75 per cent. of Silver used in Photography is generally wasted, and it can be saved by using these directions :—

"1st. *The Developer and Wash from Negatives.*—Have the wash from the sink run into a barrel or vessel having a faucet six or eight inches from the bottom; each evening throw a few hand-fulls of salt into the water collected during the day, and the next morning draw off the clear water to the faucet. When a sufficient quantity of the precipitate has been collected, evaporate to dryness. (Cyanret or Hypo should be kept out of this vessel, because they prevent precipitation.) Soda, Pyrogallic acid and Sulphuret of Potassium aid to precipitate.

"2d. Cyanide solutions can be cleared of silver by adding

Sulphuric Acid—the fumes are poisonous. Hypo fixing can be cleared with Sulphuret of Pcssassium—will take 24 hours to settle.

"3d. Washings of Prints, Baths, Dishes, &c., can be precipitated with common salt, or they can be added to the barrel No. 1.

"4th. Old Benches, Shelves, Filters, Scraps, Clippings, and all paper which has come in contact with, or has any silver on, should be saved and burned in a furnace or stove with a slow light draft. The ashes can be burned in a crucible to extract the metallic silvrr, or sent with the precipitates to a refiner. The precipitates can be dried or put into bottles. (Save all drippings from Tablets, Plates, and shields.")

The greater part of the paper is made up of recipes for collodion, and printing and toning solutions, which are worthy of no further remark than that Divine's, or any other standard manual, will afford equivalent information in a more reliable form.

The following paragraphs contain probably all the information which may be new to photographers. The plan of coating glass plates with albumen, although not new to us and to many others in this city, to our knowledge has never before been printed. It seems evidently the most ready and efficient plan of securing an even film.

"To Coat Glass with Albumen.—Take the whites of 3 fresh laid eggs, separate from the germ, put them in a clean bottle, add one pint of rain or distilled water, shake well for 10 minutes; then add Iodide Potassium 5 grains, Conc. Ammonia 10 drops, shake 5 minutes longer; filter and keep corked. After the plate had been soaked in dilute nitric acid, rinse clean with soft pure water and drain; while yet damp flow with the albumen; repeat the flowing and rear the plates on one corner, on clean damp blotting paper, to drain and dry; when dry pack in a clean grooved box; keep free from all particles of dust. These plates will keep a long time and will work quicker than any other way of preparing plates."

"Quick Collodion.—Alcohol and Ether, equal parts, to each ounce add: Iodide Cadmium, 4 grains; Bromide Cadmium, 1 grain; Cotton, 6 to 9 grains; Hydro Bromic Acid, 1 drop."

"To Color Albumen Prints with Water Colors, so They will not Rub Off.—Take the white of a fresh egg, separate the germ, and beat the white to a froth; add 8 drops conc. Ammonia, and beat again for a few moments, and set aside to settle; pour off the clear albumen, strain through linen, and keep in a bottle well corked. Use good water colors, and take the albumen to mix them with. Care should be used in putting on the color, not to get it on too thick, but lay on several coats, until the color is deep enough.

These colors are albumen on albumen, and will last as long as the prints, and will stand any amount of rolling in a card press."

The paper closes with a postcript, which offers still another chance to the humbugged purchaser. This is it :—

"P. S. I have also a very fine receipe for making Chloride of Gold, one bottle of which is equal to four you buy. Enclose me $1 and I will forward you the receipe."

Farewell to our dollar and to the "Valuable Formulas!"

The American Photographical Society.

FIFTY-SEVENTH MEETING.

The Society held its first meeting of the winter session at the University, on the evening of the 10th; vice-president Joy in the Chair; O. G. Mason, Secretary.

The evening was mainly occupied in the discussion of the report of the Committee on Permanent Location. The committee recommended a room on the corner of Broadway and Fourth St.; the new premises to be occupied by the Society in January next. In order to meet the expenses of furnishing the place, they proposed that funds be raised by voluntary subscription among the members. The report of the committee was adopted, and the necessary arrangements made for carrying it out.

The Secretary announced that Mr. Osborne, lately from England—an inventor of important improvements in the photolithographic process, had arrived in the city, and was prepared to explain his process, and exhibit specimens to any members of the Society, but was unexpectedly called out of town for a day or two.

A committee was appointed to confer with Mr. Osborne on the time and place of a special meeting. This meeting will probably take place on Monday evening, 17th inst., at vice-president Bogardus's, corner of Broadway and Franklin street.

The Society then adjourned.

Toning Transparencies.

M. Adolphe Martin employs the following process to give to the proofs obtained as transparencies a beautiful black color :—

The positive developed with iron solution is washed with care, and before fixing, the surface is flooded with a solution of bichloride of mercury. At the endof several instants of contact, it is washed off again. It should then be covered with a solution of hyposulphite of soda, or cyanide of potassium, previously saturated with nitrate of silver (so that no more will be dissolved).

This last solution does not fix the proof; but it is partly decomposed by the mercury which is deposited upon the proof. The silver is precipitated in very fine powder, and gives great brilliancy to the image.

The positive is then fixed with cyanide of potassiam at two per cent., or with hyposulphite at fifteen per cent., without any addition of silver, and is terminated by a good washing with abundance of water. For my part I dislike the use of mercury, and think the proofs are more unalterable when the toning is done with a feeble and neutral solution of chloride of gold and calcium after the fixing is performed, and I prefer the use of the sulphocyanides to hyposulphite, which is so dangerous a thing to touch with the hands while working with collodion and silver baths, and should be avoided, or the whole may be easily spoiled.—*Brit. Journ.*

Editorial Department.

———Save the Silver! A stranger with a bundle under his arm came into our office one day, when the following conversation took place. The stranger accosted us with: "Do you buy chloride of silver here?" "Yes." "How much do you pay?" "If the chloride is pure and dry, it is worth $30 per pound." "Well," said the stranger, evidently pleased withthe price, "I have a little lot to sell you; I know it is pure, for I precipitated it myself with clean salt, and dried it in an oven as dry as chips." We weighed the bundle without opening it, and found the weight to be over six pounds. We remarked that the bulk seemed too large for the weight, but accounted for it by supposing that the chloride had been precipitated from weak solutions. On opening the package we found that the contents had a harsh feel like sand, to the taste the powder was decidedly saltish. We could not pay $30 per ℔ for it, nor any other price without further test. We put the stuff through our usual process for reducing the metal and extracted enough silver to warrant us in paying about $10 or it; the stranger's hopeful vision of $180 terminated in that small reality.

This man had been told that salt would "throw down" silver, and to make sure that all his silver shonld go down, he put in a plenty of salt; salt is cheap silver is precious, said he, and in goes an ounce of solid salt for every grain of silver. When the silver and salt were down, he poured away the water, and put the mass at the bottom to dry. These are probably the facts of the case.

Salt throws down chloride of silver, but it has another property which prudent photographers must not forget; it throws down chloride of silver but it picks it up again—salt dissolves chloride of silver. If our stranger had attempted to wash his chloride by stirring, decanting, &c., he would probably have lost every atom of it. Any salt in excess of what is needed to precipitate all of the silver, takes away from the amount of silver which will be saved.

We think photographers will do well to abolish salt altogether. We never use it for precipitating silver; but in its stead use and recommend hydrochloric acid. The chloride precipitated with acid, falls more promptly, and none of it is dissolved. Hydrochloric acid costs more per pound than salt, but we are satisfied if it were in general use, the acid bills would be smaller than the present salt bills.

Minor Correspondence.

E. W., Jr., of Pa.—"Please inform me why it is that when my negatives dry the whole film is so opaque that it is worthless. The opacity sometimes disappears when the plate is varnished, sometimes does not. The collodion worked very well for about the first six weeks after it was made, and I am certain that the fault is in the collodion. At first I thought that it was because I made it with bromide of ammonium which had to be dissolved in a little water, but in that case it would most probably have worked badly at first as at last." ....We know of only two causes for such a difficulty as yours, viz., bad gun cotton and water in the collodion. In your case probably both exist.

H. C. P , of Pa.—"I have been looking for some months past for a plain floor cloth or carpet, instead of a figured one. Can you inform me if such an article can be had in your city? I see most of the New York pictures are taken in that style, and, as I am about to make some changes, I would like to have something similar, as I am tired of figure-grounds." ....We have never seen any plain oil-cloth for sale. Of course any floor cloth can be painted of a uniform tint. The common practice is to finish the floor carefully and paint it as desired. You can purchase baize and other cloth which would answer for a floor cloth.

J. S. M. B., of Pa.—"I toned some prints the other day and they did not meet my expectations in clearness, &c. They were albumen prints; paper was silvered on an eighty-grain bath, slightly alkaline, made so by about a drop liq. amm. to the ounce of silver; the paper was then thoroughly dried and fumed with strong liquid ammonia; and then after a thorough washing toned in an alkaline soda (bi.carb.) bath about blood-warm, and now what I wish to know is this. The prints I put in the bath while warm, toned very slowly and after they were fixed were of a dull and mealy appearance; while other prints, some of them from the same negative, were put in the bath after it got quite cool, and toned somewhat quicker, and were bright and clear after fixing and drying; precisely the reverse of the ones toned in the bath while warm. What bromides and iodides are best suited for negative collodion? ....The case is a little extraordinary. We only venture to suggest that your prints were over-toned. There is such a thing as having a bath too strong We would like to have the opinion of ohters on the case. ....A favorite recipe for collodion is, **iodide of ammonium, 5 grs.; bromide of cadmium, 2 grs.; plain collodion, 1 oz.**

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[NEW SERIES.]

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The Manufacture of Chloride of gold.

THE following method of preparing chloride of gold by Mr. Francis G. Eliot appeared in a contemporary a few weeks ago. There is so much that is useful and interesting in the communication that we have pleasure in giving it publicity for the benefit of those of our readers who may be disposed to attempt the manufacture of their own chloride of gold. We may have a few other particulars with which Mr. Eliot has favored us in addition to his original communication. The cost of the chloride of gold he produces is greater, he informs us, than the price of the commercial article; but it tones three times as many prints as any sample which he has been able to buy. This is no doubt due, in addition to the absence of any contamination, to the fact that it is perfectly neutral. One of the greatest drawbacks to many commercial samples, is the uncertain quantity of acid they contain, and thus in using them the proportion of any alkaline salt, which may be used, which is sufficient to produce an admirable toning solution with one sample, is sufficient with another to render inert and useless a large proportion of the gold present. Mr. Eliot's preparation, when in a neutral ten-grain solution is of rich red color, and will keep without precipitation of the gold for two or three months, even in the light; but we recommend photographers for safety always to keep gold solutions in the dark. If Mr. Eliot's instructions be carefully followed, we believe no failure need occur; but it is only right to remind those of our readers not accustomed to chemical manipulations, that the exercise of great care and intelligence is necessary, as the experiment is an expensive one in case of failure. Simple as the means of success appear to a skilled hand, it is a fact that we have recived many records of failure from experimentalists who state that they have observed all the conditions of success. Let first attempts therefore be with a small quantity of gold. We now subjoin the chief part of Mr. Eliot's communication, as it appeared in the *British Journal*:—

Having made chloride of gold ever since the early days of the daguerreotype, in which it was of equal importance to have this indispensable article in the greatest perfection, in combination with hyposulphite of soda, for fixing the pictures, and having, possibly, since that time dissolved some hundred pounds' worth of gold, and practically used a great portion of it in the various establishments in which I worked as an assistant, will plead as a reason if I am rather dogmatic in insisting on my formula being the best, contrary to the generally-received opinions of the trade, some of whom manufacture an article quite as much for *sale* as for use. The principal opinion which I hold is, that this article, in the best state for photographic purposes, cannot be prepared so as to be sent out in a dry or crystalline state, but must be kept in a state of solution.

Chloride of gold in the best state for toning, as far as regards *rapidity* in giving color to the prints, *depth* of color, freedom from mealiness and richness of deposit, is a *highly deliquescent, non-crystalizable* salt, and, therefore, ought only to be sold in stoppered bottles in a state of solution.

My method of manufacture is as follows:—I generally dissolve three ounces of what is known by the assayers as fine gold. Any other quantity, more or less, can be taken, suiting the proportion of acids accordingly. Putting these three ounces in a glass flask I pour upon them four fluid ounces of hydrochloric, and one fluid ounce of nitric, acid.

I am rather particular in these proportions of the two acids. There is less nitric to the hydrochloric in my receipt than is usually recommended. It is very possible that some of the hydrochloric may be wasted and lost by having this excess of it; bnt the chloride of gold is never so good if the ordinary proportions of nitric acid to three of hydrochloris acid be adopted.

I add no water, but simply allow them to digest spontaneously, in the summer. In winter they will require a slight warming: placing the flask on a small block of wood on the kitchen boiler will be sufficient.

In twelve hours these acids, which will have become saturated with gold, may be poured off, and a similar quantity put in the flask; in another twelve hours do the same, only putting in half the quantity of the mixed acids, namely, half an ounce of nitric and two of hydrochloric, which will complete the dissolution of the gold.

The whole solution of gold is now to be put into a large *thick* Wedgewood-ware evaporating basin, and placed over a common ring gas stove—which I prefer, as I can regulate the heat to a nicety—and the contents evaporated until the whole becomes a solid mass of crystals. I generally set my evaporating apparatus going early in the afternoon, so as to reach this state at night. I then put out the light, cover the basin over, and let it repose all night, as our foreign friends say.

Now comes what I consider the most important part of my process. Early the next morning, taking the basin, I pour on it two or three ounces of water, and lighting the gas again, I continue the evaporation at a low heat all day, and, as it reaches the point of solidification, add a little quantity of water. This is repeated five or six times in the course of twelve hours, and each time there is an alteration in the appearance of the chloride of gold.

At the first evaporation it appears in a well-defined crystalline form, but after each evaporation the crystals get smaller, until at last it assumes the form of a blood-red, amorphous, and granular mass, which, directly the basin gets cold, begins rapidly to run to liquid, so that it is quite impossible to weigh it out so as to put it into bottles.

Calculating, therefore, that the three ounces of metal will make about 2,200 grains of chloride, I wash out the contents of the basin, the stirring rods, &c., with twenty-two ounces of water and pour into a stock-bottle, which of course gives me twenty-two ounces of solution of gold at 100 grains to the ounce.

To prepare this for use, I first reduce it to ten grains to the ounce, by adding nine ounces of water to every fluid ounce of the 100-grain solution (thus adopting the decimal system which I find most convenient in practice), and add a good teaspoonful of common washed whiting to the bottle.

After remaining for about four or more days, occasionally shaking the solution is of a deep orange color, and if poured carefully off and the last portions filtered, will keep without reduction for a month or more.

It is now in an excellent state for most of the usual toning receipts, but especially suited for the lime-toning bath, made either from acetate of soda and chloride of lime, or a mixture of both.

Many operators have complained of a want of success in the new chloride of lime process. I think that can be easily explained by the article they have used for chloride of gold.

The way this is manufactured on a large scale is as follows :—The metal is dissolved in a large quantity of mixed acids (with an excess of nitric), more than sufficient for its solution. The dissolved gold is then placed in a large evaporating basin, and a workman stands over it with a tub of washing soda by his side. He then with one hand takes up handfuls of this, which he throws in, stirring it all the time with a rod in the other. His test for ascertaining that he has added enough is when it ceases to "*fiz,*" as he calls it, which is the only scientific term which he is acquainted with to describe or explain the appearance. The whole is now evaporated down to a solid mass, weighed out, and put up in little bottles for sale.

Conscientious manufacturers, however, do take the trouble to test a drachm of it, to see what percentage of metal it will contain when dissolved, and, having found out this, they guarantee it to contain so much accordingly.

Now, I would ask my brother photographers and printers what good can more than 50 per cent. of chloride of sodium and nitrate of soda do in the toning bath ? Are they even harmless ? I think not. I have always found that the more chlorides in the toning bath the slower the action, the weaker the deposit, and, consequently, greater loss of definition in the print before it gets fully toned.

I cannot help thinking, from practical experience, that no more chlorides should be in the bath than are actually required for accomplishing the necessary decompositions which take place within it. It is very true that a definite sodio or potassio-chloride of gold can be obtained; but not by the way I believe it is usually manufactured. The acid solution of gold should be crystalized by evaporation, and then re-crystalized several times in order to obtain a pure article of definite composition.

If this would add too much to the expense of manufacture, then the better plan is to make a plain chloride, as pure and free from acids as possible, by the method I adopt, namely, using excess of hydrochloric acid to dissolve the metal, and driving off that excess by a long slow evaporation which requires hardly any attention; and then rendering perfectly neutral by common whiting, after which it will keep for several months free from reduction of the metal.

As photographers must still continue to use this valuable metal until the tfme when gold and silver will be both banished from our printing laboratories, I trust this communication may add somewhat to our knowledge of this indispensable article.—*Photo. News.*

The Stereoscope.

We were conversing some time since with an intelligent friend with regard to the advantages to be derived from the use of stereoscopic photographs, when we were answered by the declaration that he had been compelled to give up the use of the stereoscope altogether on account of the over-fatigue of his eyes, and an invariable headache produced by it. Not long afterwards a lady made a very similar declaration, and showed us, at the same time, a small lot of stereographs which, she maintained, had produced the last headache.

We carefully examined these photographs and also the stereoscope which had been used in connection with them, and we intend shortly give to our readers the result.

At present we simply desire to say, that it is quite evident that if the headaches and the soreness of eyes, and general sense of weariness and fatigue, are really caused by the stereoscope, or the stereoscopic pictures, it behoves all those commercially interested in the production and sale of these articles to give heed to the matter, and, if it be possible to cure the evil, to do so at once, or they may find their occupation shorn of its proportions, or, at least not increasing in the ratio they had supposed it would.

The stereoscope, as a mere matter of scientific or popular curiosity, has had its day; and now, if it is to maintain an important position in public estimation. it must do so, evidently, by resting on its intrinsic merits. Anything which is justly calculated to excite the suspicion that its use is injurious to the health, or adapted to impair the eyesight, will tend in a very forcible manner to banish it from the drawing-room table, and consign it to the desk of the amateur photographer or student of optics.

We need scarcely say that we should be sorry to see any such tendency establish itself. We desire to have the stereoscope become a much more popular instrument of pleasure and instruction than it has ever been; and it is with this object in view that we intend to point out the causes of the complaints to which we have alluded. It will not be difficult to show that they are by no means imaginary; but, that, on the contrary, they have a real foundation.—*Brit. Journ.*

Photography Without a Nitrate of Silver Bath, and Without Development.

BY P. E. LIESEGANG.

In a late number of the *Photographic News* you describe a process for making negatives without a nitrate bath, the nitrate of silver being added to the iodo-bromized collodion.

I beg to state that I have published a quite similar process in the *Photographischis Archiv*, of May 16th, and in *Le Moniteur de la Photographie*, and that this process has given good successes in the hands of several persons, in this and foreign countries.

I prepare the collodion in this manner :—Iodide of silver is precipitated and washed with distilled water, then dissolved in a saturated solution of iodide of potassium; then I take good uniodized collodion prepared with *absolute* spirits; to this I add as much of the iodide solution as is necessary, in order to give a creamy dense film when poured on glass; of course, the iodide of silver is precipitated in the same moment as it is added to the collodion, and makes it opalescent, milky white.

This mode of introducing the iodide of silver into the collodion I have selected, and I prefer to any other mode, because the iodide of silver precipitated in this manner is much more finely divided than that precipitated by mixing solutions of nitrate of silver and iodide of potassium.

The collodion is to be poured on a glass plate, washed with pure water, covered with tannin, exposed and developed in the manner you describe. I also have developed several plates with a mixture of iron and ammonia developer with nitrate of silver solution. These negatives were very clear, but not dense enough, and had to be in tensified afterwards. The collodion containing iodide of silver does not change; at least, I have obtained the same results with it when quite fresh, and when three months old.

I make use of this opportunity in communicating to you the curious results of some experiments I made to-day, and which prove that developing also is a thing which is not always necessary in the negative process. Indeed, I was much surprised when opening my dark slide, to perceive a beautiful dense negative on the film I was going to develop. The development had taken place in the camera, a solution of gallate of lead having been mixed with the silver solution upon the film before exposition. In a second experiment, I used my ordinary pyro. solution, 2 grains pyrogallic acid, 20 minims acetic acid, 1 ounce water, which I appplied in the same manner as a preservative, but without any washing. The negative came out of the camera quite ready, nearly dense enough for direct printing; in order to make a little blacker, I used a mixture of iron intensifying solution (with citric acid), and a drop of nitrate of silver. Tannin gave the same result. With an iron developer there was some veil, perhaps not enough nitric acid had been employed. The negatives obtoined in this manner are of a very fine character; they have the bloom so much liked, they are finely detailed, and uery clear, resembling much the dry tannin plates developed with acid solutions. All these experiments have been made with a good bodied and alcoholic collodion (prepared in June), containing a large proportion of iodide and bromide, and with a new 40-grain nitrate bath, not acid. Two negatives I took with a thin (English) collodion which has been iodised five months ago. They had nothing of the bloom of the thicker collodion, although sufficiently out.

The develepment in the camera will, perhaps, give a means o ascertaining when the time of exposure is sufficient. An opening, fitted with yellow glass, might be made into the camera for looking in. If it be not possible to use this for portraits, it will, I think, do with reproductions, views, &c., so that it may save much pain and time to the operator. Solarisation is not possible when using this process, so that perhaps harmonious pictures will be obtained from much contrasted objects.—*Photo. News.*

On the Spontaneous Decomposition of Pyroxyline.

BY M. DE LUCA.

Upon presenting to the *Academie* my first researches upon the products of the spontaneous decomposition of pyroxyline, on the 12th of August, 1861, I promised to continue them. I now submit to its judgment the results obtained in determining the several conditions under which the decomposition of pyroxyline is produced.

In the first place the condition of keeping the gun-cotton sheltered from the light does not always furnish good results, particularly when the vessel which contains it is badly corked, and is surrounded with a moist atmosphere. Once the reaction has commenced with a slow disengagement of nitrous gas, it is not possible to stop it. This decomposition is greatly facilitated by the action of light, and still more by those of the direct rays of the sun, or of artificial heat.

A sample of gun-cotton was, after a commencement of spontaneous decomposition in the dark, divided into four portions, one of which was left in the dark, another was placed in the diffused light of a chemical laboratory, the third was exposed to the direct action of the sun's rays, and the fourth to the action of heat supplied by a *bain marie* marking 125° F. It was observed that while direct heat produced a vivid reaction upon the gun-cotton, direct light acted with less energy; that diffused light exercised a very slow action, and that in the dark, the gun-cotton was decomposed with extreme slowness. This spontaneous decomposition produced four very distinct phases : the gun-cotton, during the first phase of decomposition, slowly contracts without losing its primitive form, so as to occupy one-tenth of its original bulk. It remains in this state several days, and then it begins to dissolve, and is converted into a sort of gummy substance which strongly adheres to the fingers, and has lost its cottony texture; the bulk of it is also diminished one-half; this state constitutes the second phase of spontaneous decomposition of gun-cotton. The third phase commences after a shorter or longer time, according to the temperature of the atmosphere; the phenomenon it produces is not a contraction but a dilatation, so that the cotton which has lost during the second phase nine-tenths of its primitive bulk, swells as much in the third phase, that it occupies the entire capacity of the vessel which contained it before its decomposition, that is to say, it has becomes nineteen times more bulky after its last contraction : in this state the gummy aspect continues to manifest itself, but the mass is porous and full of cavities, like a sponge. During these three phases, there is disengagement of nitrous fumes, which are abundant during the third phase; still, this gaseous disengagement diminishes in a sensible and progressive manner, and we then perceive that the matter loses its gummy aspect and yellow color, becomes brittle, so much so, that it can be reduced to powder, between the fingers, and assumes a white color, like sugar. This state constitutes the fourth phase of cotton which decomposes spontaneously. The time necessary for the accomplishment of these four phases varies according to the temperature of the atmosphere, but it requires at least five months for their accomplishment.

Thus, gun-cotton, by the slow action of its own elements, and at the ordinary temperature, loses all its primitive properties in disengaging gaseous substances, in which we recognise the presence of nitrous compounds, and some traces of formic and acetic acid, and leaving for a last residue an amorphous porous matter, comparable in appearance to sugar, very acid, and almost wholly soluble in water, and containing abundance of glucose, which can be easily isolated, gummy waters, oxalic acid, and a small quantity of formic acid, and an acid which I believe to be a new one, from which I have obtained a salt of lead, and which I shall examine hereafter.

The glucose resulting from the decomposition of pyroxyline has the taste and aroma of honey; it reduces tartrate of copper and potassa with great facility, and it ferments in contact with beer-yeast, with the production of acid, and alcohol. The quantity of glucose obtained from 100 grammes of gun-cotton spontaneously decomposed, was about 14 grammes.

Gun-cotton of good quality, exposed to the direct action of the light of the sun, soon exhibits signs of decomposition, at first by the odor of nitrous compounds, and afterwards by the yellowish color of the vapors disengaged. All the specimens of pyroxyline that I experimented upon have become decomposed in a shorter or longer time, under the influence of the direct rays of the sun. Sometimes the change in the gun-cotton begins during the first day of the experiment; at other times the decomposition manifests itself after many days' exposure to solar light. In these experiments the thermometer stood at about 86° Fah., and the temperature seldom rose higher.

Artificial heat acts more energetically than solar light, but always at a temperature more elevated than that produced by the direct rays of the sun. A sample of gun-cotton was divided into two equal parts, one of which was exposed to the direct action of the solar light, and the other in an oven to a temperature of 95° to 100° Fah.; the pyroxyline exposed to light decomposed first, the other portion was not altered by the action of 36 hours' artificial heat. There is then a peculiar action in the light of the sun which provokes the decomposition of pyroxyline.

When the gun-cotton is compressed, it is decomposed more readily both by the action of solar light, and by the application of artificial heat. In the Month of December, 1861, I introduced some pyroxyline into a test tube, and compressed it with a glass rod; I then made a vacuum, and closed the tube hermetically at the spirit lamp. The gun-cotton thus enclosed has been kept to the present time without showing any signs of decomposition; while similar samples, introduced into cork or ground glass stoppered bottles, or simply covered with paper, have all changed in a few months, that is to say, during the year 1862. It will then be important to verify these facts upon a large scale, and see if they will afford a ready application to the conservation of gun-cotton for the wants of industry.—*Comptes Rendus.*

Double Printing for Portraits.

We have recently received from Mr. C. Twyman, of Ramsgate, an admirable specimen of portraiture which illustrates very strikingly the value, in portraiture, where the highest interest is desirable, of double printing. The portrait is that of Sir Moses Montefiore, who was unwilling to be taken otherwise than in his own home, and surrounded by the accessories of his usual sitting-room. Mr. Twyman has succeded admirably in producing a fine likeness, and a satisfactory and artistic picture.

The venerable baronet is seated on an antique chair with a newspaper which has just dropped on his lap, whilst he contemplates an oil-painting of his late wife, which stands on an easel before him. The background and accessories consist of the interior of a room, with ground and roof and furniture, in which a grand organ is an important object. The figure and foreground accessories are produced on one negative, and the interior, &c., on another negative; the latter whilst sufficiently made out, are kept quite distant, and unobtrusive; the figure being at the same time bold, vigorous, and round, possessing fine relief against the less pronounced background. The attitude and expression are easy and natural and the composition altogether good. The picture is about fourteen inches square, with dome-shaped top, mounted on india paper, made expressly to suit the shape of the paper.

The double printing is here admirably managed, and an effect produced which it would have been utterly impossible to obtain in one negative. A very skillful use appears to have been made of a pencil of sunlight, in sunning down obtrusive lights, giving distance and atmosphere where they were required, and introducing shadows to complete the *chiaroscuro.* It appears to us, that this is a direction in which but little has been done, and that there is ample scope for some skillful photographers to make a speciality of "portraits at home," from which profit and credit may be derived. Each picture would of course require the exercise of considerable taste, judgment, and skill, and would command an equivalent ratio of remuneration. We commend the matter to the attention of the skillful.

We understand that this is the first photograph of Sir Moses Montefiore, and the only one he will sit for. He has been fortunate under such circumstances in securing a real work of art, as well as a good likeness.—*Photo. News.*

Diamond Cameo Photographs.

We have another novelty to bring under the attention of our readers, which will at once arrest the attention of portraitists. We have frequently heard the opinion expressed of late, that the "carteomania" was on the wane, that everybody had obtained his card picture, that the albums were full, and the public beginning to be sated. No doubt this is, in some quarters, to some extent true. The question has been asked, What will be the next fashion ? In answer to this question, solar camera pictures, or other enlargements, have been doubtfully mentioned. These it is very probable, will come into increased demand : but the demand can never become the rage at all similar to that which has existed during the last few years for card pictures. The price and size at once preclude the possibility. To take the place of cards for which the demand begins to flag, the picture must be as cheap, as easily exchanged and preserved, and at least as pretty. The novelty we have to announce, more than fulfils these conditions.

The "Diamond Cameo Portrait," introduced by Mr. F. Window —whose interesting communications to these pages are familiar to our readers—or more properly by the firm of Window and Bridge, will, we think, give a new impetus to photographic portraiture. The size is the same as that of the card picture, the cost of production is no greater, whilst in beauty, likeness, variety of interest, and force of effect, equals most phases of portraiture. The

picture, as issued by Messrs. Window and Bridge, is the size of an ordinary card, and contains four portraits, each giving a different view of the face. Each portrait consists of a bust about an inch long, and three-quarters of an inch wide : two are side by side in the middle of the card, and two at the top and bottom, arranged
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in this order 0 0. The top and bottom generally consist of a front
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face view and a three-quarter face view; whilst the others consist either ot two entire profiles, one of the left and one of the right side of the face, or of a profile of one side, and a five-eighths view of the other: but of course much variety in this respect is possible. But the especial peculiarity, and that which gives the cameo effect of the picture, is yet to be described : the oval containing each bust is punched into relief, so as to have a convex surface. The effect of this in giving the illusion of roundness and relief to the whole image, cannot be readily imagined by a person who has not seen it. It is difficult at first glance to believe that the features have not a special relief of their own, and the cameo effect is perfect.

Such a style of portraiture has many real charms and points of interest, besides that of novelty. Almost all the artistic difficulties which beset the photographer are got rid of. The graceful arrangement of hands and legs, and their delineation in anything like true proportion and in good definition, cease to distract the mind. Each small head is taken with the centre of the lens, and is unexceptional in definition; and as the full aperture of the lens may be used without hesitation, the exposure is so rapid that there is no difficulty in obtaining good expressions, an end which is further aided by the entire absence of all torture in the way of arranging awkward limbs, a process so frequently fatal to a pleasant or natural expression in the face. As to the question of likeness and verisimilitude, the interest of this style of picture must at once commend itself to every one. There are few people who have not two or more aspects of the face with greater or less degree of dissimilarity. and it not unfrequently happens that the view which is most pleasing as a picture, is less striking as a likeness. The photographer in producing the picture, is thus placed between the horns of a dilemma; if he produce the pleasing picture, candid critics remark, "Very pretty, but certainly not strikingly like;" or if he secure the striking portrait, the equally candid opinion is, "Very like, but certainly not flattering." In this phase of portraiture, there are four aspects, all under the eye at once. The mind rapidly and unconsciously combines these, and perceives the complete embodiment of the original in its natural aspect, a general rather than a specific likeness, a complete rather than a partial portrait. There is, moreover, in such pictures an entire absence of all vulgarity, the effect being quiet, classical, and artistic.

We have not space now to enter into a detailed description of the mechanical arrangement employed in getting the best result with the least trouble. A very ingeniously contrived dark slide has very simple movements for obtaining the four portraits in their due positions. and of the right size on the plate. When printed and mounted, the convexity of each disc is produced by means of a steel punch and an arming press, which is worked very quickly. The exquisite surface given by the face of the die to the picture, far exceeds that produced by rolling.

The general effect is that of four cameos or enamels dropped on to the card. We understand that the demand for them since their introduction has been very rapid, and they have elicited high enconiums from the highest personage in the realm.

The Diamond Cameo form of portrait is, we understand, registered. Information as to commercial arrangements, will be found in our business columns.—*Photo. News.*

A New Step in Photography.

Few of the arts show such signs of vitality as the infant one of photography. It would be strange, indeed, if an art which has so much novelty and marvel about it, which gives to idlers the most graceful amusement, and to workers the most splendid results, which interests equally the man of science and the lover of art, which yields not merely a livelihood, but immense gains to many who practice it, and which is, nevertheless, in its infancy, should not display great vigor and make continual progress. One more step of a mighty progress we chronicle to-day—a step that, though small, in itself, is of immense importance, and amounts to a revolution in photography. It is the step by which, now, at last, we can produce a permanent print. Englishmen and Frenchmen have hitherto carried off the chief honors of discovery in photographic science; but this last discovery is the work of a German. To explain more clearly what he has accomplished, we propose to state as rapidly as possible what has been already done in the science.

It is not very long since Wedgwood and Davy failed to fix the image which sunlight impresses, and had long been known to impress upon any surface impregnated with nitrate of silver. Documents exist which prove that though pictures on silvered paper were obtained at the commencement of the present century, no means could be found to fix the fleeting image. Disheartened by continued failure, our men of science let photography go to sleep, and nothing effectual was done in it until, excited by the discoveries of Niepce de St. Victor and others, Daguerre obtained pictures on metal plates that promised permanence. The application of vapor of iodine to the silvered plate gave the Daguerreotype image, and this process was the pioneer of all the so-called "negative" processes now used in photography. Scarcely had the beautiful process of Daguerre been made public when our countryman, Mr. Fox Talbot, made a further step in advance—one which at once gave a great practical value to the photographic art; he discovered upon paper so-called "positive" images of the objects to be pictured. Independently of Daguerre, he had succeeded in producing negative images on paper,—that is, images in which the conditions of light and shade are the reverse of those existing in nature, the shadows being represented by lights, and the lights by shadows. He now succeeded in printing from this negative, any number of positive images, in which the lights were lights, and the shadows shadows. It was a vast stride, and that which followed was also vast. It was recommended by LeGray that collodion should be used as a vehicle for the sensitive salts which, spread out in a film, receive the sun picture. The practical mind ef Archer seized the idea, and spreading the collodion on a glass plate, discovered the means of obtaining very much increased delicacy of detail—a negative picture of far greater value than paper could possibly produce. Thenceforward to the present time various improvements have been made in the process of taking the original negatives. Greater sensitiveness, and, as a consequence, greater rapidity of action have been imparted to the collodion film; and this negative process now leaves little to be desired, save and except one thing—the means of impressing the sensitive surface instantaneously with any kind of picture. Instantaneous pictures of great beauty have been obtained, and chiefly by Col. Stuart Wortley, but they are for the most part confined to the representations of objects brilliantly lighted. Save for this defect of instantaneousness, the method of taking negatives on a film of collodion spread over glass is well nigh perfect.

It is in the process of transferring the negative image into a positive one many times repeated that the chief difficulty of photography now arises. A perfect negative having been obtained, it is necessary to print off hundreds and thousands of copies on paper. The paper itself, and the materials with which it is prepared, as the albumen and the nitrate of silver, vary not a little in their action—vary, indeed, so much it is rare to get twenty copies of any individual photograph that shall be all alike. Worst of all, the materials used, in the preparation of the prints contain within themselves the elements of destruction. The most important materials used in the preparation of paper for printing positives are albumen and nitrate of silver. A film of albumen lies upon the paper, and the surface of it is prepared with silver to receive the print, which is then submitted to various washing prccessess in order to render it as permanent as possible. All questions of permanence, however, it is difficult to establish, and when we come to consider them, we remember of the wise youth mentioned in every Greek *Delectus*, who, hearing that ravens live a hundred years, kept one to see if it were true. Unfortunately, it is not necessary to wait so long in order to discover that the great majority of photographic prints are certainly doomed, and that the chances are against all in which silver and albumen are used. Nitrate of silver is so difficult to work, and so uncertain in its effects, besides being expensive, that men of science have long been on the look-out for some other metallic salt that would take its place. The nitrate of uranium has been tried, the ammonia-citrate of iron, the chloride ot gold, and so on, but hitherto with little success. The nitrate of uranium seemed to promise permonence in the results which it gave, but these results were attained with great difficulty, and were only in rare instances of a fine quality.

The new process which has been discovered in Germany by Herr Wothly, and from him has been named the "Wothlytype," discards nitrate of silver, and discards albumen. For the former it uses a double salt of uranium, the name of which is at present kept secret; for the latter it uses collodion. We have explained that by the ordinary method, the paper to be printed is sized with albumen, ane the surface of the albumen receives the silver preparation, which is sensitive to the light, and shows the printed image. The paper thus does not receive the image, but is, as it were, a mere bed on which lies the material that does receive it. By the substitution of collodion for albumen, a different result is reached. In the first place, the film of collodion on the paper yields a beautiful smooth surface on which to receive the image, and the result is, that pictures are printed upon it with wonderful delicacy. In the second place, the collodion before it is washed upon the paper, is rendered sensitive by being combined with the salt of uranium. The sensitiveness, therefore, is not on the surface alone of the collodion film, it is in the film itself, and so completely passes through it, that even if it be peeled away from the paper, the image which it received will be found on the paper beneath. The vehicle thus employed is not less superior to all others yet known for printing the positive image on paper, than it is to all others yet known for receiving the negative image on glass. The metallic salt which combines with it has also rare merits.

In the first place, the manipulations are very simple and easy—far more so than in the silver-printing process—and thus the labor saved is considerable. Next, the paper, when rendered sensitive for printing, or "sensitized," as the photographers say, keeps perfectly for two or even three weeks—an immense boon to amateurs, who can thus have their stock of printing paper "sensitised" for them; whereas at present, when the paper receives the sensitive preparation, it has to be used almost immediatley, and will not keep more than a day or two. Thirdly, the color and tone obtained are very various, including every shade that can be got by the ordinary silver plan; but, in addition, it has the advantage of being able to print any number of impressions of exactly the same color, and of doing away with all such difficulties as show themselves in mealiness and irregular toning. The precision of result is a great point. By the silver process, the results are never certain, and even when the print comes out perfect from the frame, the subsequent process of washing and fixing go seriously to alter it.

Lastly, the permanent character of the new method is very remarkable. Nobody seems to know exactly why the old silver process gives way—whether it be on account of the albumen, or the nitrate of silver, or the hyposulphite of soda. We only know that so many of the prints prepared by the old method fall away, that no reliance can be placed in those which seem to stand firm. We know how apt silver is to tarnish, and especially in atmospheres that abound in the compounds of sulphur. Some photographers seem to think that it is this sulphur which does havoc to their labors. Whatever it be, ordinary photographs fade, or darken, or in some way alter, and give us little hope of the fixity of those which still hold good. If it is the sulphur of the atmosphere or the albumen that does the mischief, then this which tells so much upon silver has no effect upon uranium; and the images pictured on paper prepared with uranium and collodion, give every prospect of lasting as long as the material holds together. These pictures have been exposed to sun and rain for weeks together and give no sign of alteration. Water seems to have no effect upon them. We have seen them spit upon, as a schoolboy spits on his slate and rubs it dry, and after this rough process they showed no sign of difference.

The "Wothlytype" presents some other advantages on which we need not now dwell. Its chief excellencies are those we have mentioned—that it works with exceeding ease; that it is certain in its results, the impressions being all alike; that the sensitive paper will keep for weeks ready for use; and that when it has received the printed image it will stand an amount of tear and wear, and wind and weather, which no other photographs will bear.

The process has been purchased from its German inventor by a photographic company of which Colonel Stuart Wortley is the chairman. Colonel Stuart Wortly has long been known as one of our foremost amateur photographers. Some of his instantaueous pictures, especially his pictures of clouds, are among the finest things yet achieved in photography. As the chairman of a company which calls itself the United Association of Photography (limited), he advised the purchase of the "Wothlytype," and has secured the patent rights of it as far as this country is concerned. How the company will use their patent it is for themselves to drtermine; but, hitherto, patent rights in connection witn photography have been so difficult to maintain, and the progress of the art so swiftly renders them null, that it is to be hoped they will see the wisdom of liberality, and give licences to use their patent on easy terms.—*London Times.*

The American Photographical Society.

[SPECIAL MEETING.]

THE evening of Monday, October 17th, will long be remembered by those members of the American Photographical Society who attended the special meeting called at the rooms of vice-president Bogardus, for the purpose of listening to an address by John W. Osborne, of London, a gentleman who holds a high position in the profession and undoubtedly ranks first among photolithographers.

After being introduced by Professor Joy,

MR. OSBORNE gave a very interesting history of the invention and improvements of his most interesting process of photo-lithography. In 1859, while connected with the civil engineering department of the government at Victoria, Australia; he saw great necessity for a more rapid method of reducing the thousands of maps which were coming in from engineers in the field. These maps were drawn upon a large scale, and therefore it was necessary that the size should be greatly reduced before they were published for sale and distribution. This reduction required the constant labor of many draughtsmen and was attended with great expense.

In September, 1859, he had so far perfected his process as to entirely supercede the reduction by hand, and at the cost of about five per cent. of the expense necessary for reducing by the old method. The reduction of maps which were very full of detail, requiring the careful labor of a draughtsman for many days, were by his process reduced in a less number of hours. Mr. Osborne's knowledge of photographic chemistry had led him to pursue an entirely different course of investigation from those who had preceded him in photo-lithographic experiments. Others had worked by sensitizing the lithographic stone, upon which to impress the image direct from the lens of the camera or from the previously prepared negative.

Mr. Osborne sought for such an impression upon paper as would admit of being transferred to stone and printed in the ordinary way. The triumphant success with which his efforts have been rewarded, were amply attested by the beautifully perfect productions which he exhibited to the members present. Among the collection was a series of large impressions in black and color now being published by the Prussian government, to illustrate the report of the late expedition sent out by that government to Japan and Siam. The negatives direct from the drawings of the artist who accompanied the expedition, and the transfers upon stone were made under the personal superintendence of Mr. Osborne during his recent residence in the city of Berlin, where he had removed for greater facilities and more artistic associations than in Victoria, or London. Mr. Osborne's process opens to the artist an almost boundless field, as by it his works can be reproduced not only with absolute fidelity, but at a price so low as to give a wide circulation instead of confining them to those only who are able to possess originals.

In the collection which Mr. Osborn exhibited were several copies from engravings by some of the most celebrated of the old masters. So perfectly was every line reproduced that it must be acknowledged the copies possessed all the intrinsic value of originals. Many copies from pen and ink sketches exhibited the important feature of the process, in retaining the style and feeling with which the artist endows his work.

During the evening Mr. Osborne gave the details of his process for which see Am. Journ. Photo., Vol. V., pages 228–229.

Before adjournment, a unanimous vote of the thanks of the association was tendered to Mr. Osborne for his valuable address before the members.

Mr. Osborne is now on a visit to the United States for the purpose of introducing his invention to publishers and the profession, and should meet the cordial reception to which he is pre-eminently entitled, and which Americans are ever ready to accord to science and art.

How to Restore Yellow Prints.

BY G. W. BROWN.

Some days ago I found myself with some seven dozen photographs just ready to mount; and as I sat down to do so, to my great surprise *all* of them had turned to a bright yellow. The pictures were pronounced "ruined," and my printer was set at work to fill the several orders again, and was instructed to use extra care in all the manipulations, washings, &c., to avoid another lot of the same sort. We have not yet ascertained where the fault lay, but presume it was through negligent washing between the toning and fixing bath.

A few days ago, after much reflection, I thought I would experiment and see if I could not tone the yellow pictures, not that they would be of any particular use now, but against being placed in a similar dilemma.

I commenced with soaking a part of them in a saturated solution of oxalic acid. The color remained unchanged.

To-day I soaked the balance in a saturated solution of bi-chloride of mercury. The yellow disappeared almost instantly. After washing, I put them betwen sheets of blotting paper to dry, as is my custom, but on examining them soon after, I observed they had again assumed their yellowish hue, but not as brilliant as at first. I concluded the defect was owing to defective soaking, so I again immersed them in a warm solution of bi-chloride of mercury, where I allowed them to remain for an hour or more, after which they were again washed through several changes of water, and were dried by the usual process, when they appear as clear as any pictures I have put up, and the tone not injured in the least.

I have been a very critical reader of your Journal, for the last two years, and have the late publications, and do not recollect reading any remedy for yellow prints. As other artists, with but little experience, like myself, may have trouble in the direction indicated, would it not be well to give your readers a chapter on the "causes, prevention, and cure" of yellow prints, and save all of us a world of vexation?

PAOLA, KANSAS, Oct. 16th, 1864.

Brooklyn Photographical Society.

THE Brooklyn Photographical Society met at the Brooklyn Institute, on Tuesday evening, October 25th; the President, Col. NICHOLAS PIKE, in the Chair.

After reading the minutes, the President stated that some considerable disappointment was felt at the non-attendance of Mr. Gabriel Harrison, who was expected to deliver an address before the Society.

Mr. WILLIAMSON presented the society with a complete photographic apparatus, which will be pressed into service before many months.

Mrs. PALMER, a lady of taste and skill, presented a model draft of a certificate of membership, which is very happy in design and perfect in execution.

The discussion of the last meeting—the proper contents of a nitrate of silver bath was continued, a number of members objecting to the introduction of alcohol into the bath, as per Mr. Williamson's formula, previously published. The debate finally ran away upon "pinholes" in the bath, and what caused them. So many and varied opinions were presented, on motion of the Treasurer, the subject of discussion for the next meeting was made, "Pinholes, their causes and means of prevention." This is a very important matter to photographers, and by far a larger subject than the name would indicate.

Mr. WILLIAMSON exhibited to the members a specimen of what he termed "triplet copying," by which negatives of pictures taken at different dates can be grouped and reproduced, thus making a collection from the scattered likenesses of a family or circle of friends. The specimen shown presented three heads taken a week, six months, and a year ago, which the artist had very happily united in delicate-lined photographs which looked as if just printed from one negative of the group.

The Society is increasing in numbers and interest at every meeting. It is now proposed to move to a more commodious and more central location, where the new apparatus presented can be put in operation for the benefit of every member of the Society.

Editorial Department.

——The authors of the articles on pages 204 and 206 would make us believe that great good luck has lately come to our art of photography. The "diamond-cameo-photograph"—we pause to take our breath—is to supersede the *carte;* the Wothlytype "is of immense importance and amounts to a revolution in the art of photography."

If our English brethren were not so much in the habit of drawing the long bow, we should be in a better mood to join them in their rejoicings over the new inventions. We connot easily keep out of mind the history of the score of carbon processes now defunct, each of which in turn we were told would revolutionize our art.

But in the case of the di * * photograph no mystery is sought to be made of it, and every reader can form an opinion of the merits of the picture. Is it artistic? We remember to have seen many daguerreotypes where several views of the same face were made on one plate, and it never occurred to us that such pictures were generally desirable; it is certain that the public never called for them. We might think favorably of the alleged cameo effect on seeing it well executed, but we would not at all be likely to believe that people generally would prefer that style to the plain *cartes*.

The Wothly invention has been mysteriously talked of for a long time, and no clue was given of its nature; hence we have ignored it till now. It seems to be a modification of the well-known uranium printing proces. But as it calls for collodion, silver, and gold, we doubt its economy, and as it is probably a development process, we doubt the perfection of its results. We have made many experiments in collodionizing paper, with little satisfaction. The collodion film and paper are substances of such different mechanical and chemical properties that it seems to us a very difficult thing to get them together and to keep them so during the necessary washing and drying; moreover the film often becomes brittle by the lapse of time, a fact which we have never seen in print.

To sum up the whole matter. Here are inventions of commendable novelty and interest; they are worthy of publication and praise. Had they been sent to us for this Journal, we would have found room for them and should have encouraged the ingenious inventors to keep on experimenting. It is likely that each process has its points of utility. They add to the stock of knowledge and promote the progress of our art. We ought to have more of such things. If a new process be not really useful, it is still a fact worth recording. Give us all the carbon processes, the uranium and iron processes, and the jimcracks in the styles of pictures, but please have some respect for nervous people, and use more caution in firing upon the public such heavy words as "superseding" and "revolution."

———Mr. J. W. Osborne, who has recently exhibited his photo-lithographic process to the Photographical Society, will remain in America for several months. He is at present making a visit to Philadelphia and Washington, and will shortly return to this city, and will probably make his headquarters here. Mr. Osborne is quite *au fait* in all branches of our art, and is well informed by personal observation of the practice in various lands. We take great pleasure in commending him to the polite attention of our readers who may have the good fortune to meet him.

⁂ See the Advertisements.

Minor Correspondence.

S. E. C., of Wis.—"In the Journal of Oct. 1st, in your Editorial concerning saving the silver, for which I, for one, am much obliged, you say, set a two-gallon earthen jar near the developing place to catch the waste developer, and the first washings, and *every morning pour off the water.* Do you mean empty the jar every morning into a larger vessel, say a barrel, and when full precipitate and save the chloride? or, do you mean precipitate the washings in the jar at night, pour off the clear water in the morning, and let the chloride of silver remain in the bottom of the jar until quite a quantity accumulates? Will the common filter paper, answer to catch the silver that is saved? Do you think "Shaw's silver and gold saving apparatus" a necessary article, or can I save just as much without it? I have a jarfull of old toning bath, how shall I save the gold?" ....For a gallery of moderate size, or when it might be inconvenient to have a barrel, the precipitate might be left in the earthen jar, till enough has been collected for a refining operation. When practicable, however, we should advise that the whole contents of the jar as often as filled, be emptied into a barrel. The sulphate of iron contained in the developer should precipitate all the silver; yet it would be proper to test the water with hydrochloric acid beforethrowing it away. ..A common paper filter is precisely what is needed for getting the precipitate for drying. ..We do not consider Shaw's apparatus a necessity; it is no doubt useful to those who will not use anything else. ..Gold may be precipitated with sulphuret of potassium, or with sulphate of iron, after acidifying with acetic acin.

W. M. L., of Wis., and Others —We cannot furnish any loose numbers of back volumes. We have Vols. I to VII, bound, but in no other form.

A. N. R., of N. Y.—"How shall I extract the silver from kaolin?" ....The silver contained in kaolin as ordinarily used is in the form of nitrate, and can be dissolved out with water; it would be well to add a little nitric acid to the water. Kaolin should never be mixed with chloride of silver, as in that case, the cost of the reduction of the silver is much increased

R. B., of Mass.—The solution of per-chloride of iron which you used for removing stains, was too wead. We have used the article with success, but are not prepared to dispense altogether with cyanide. Pure cyanide is not so corrosive as the commercial cyanide, but is more poisonous.

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[NEW SERIES.]

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New Artifices in the Employment of the Stereoscope.

BY M. MC. A. GAUDIN.

The application of the stereoscope to photography has been one of the most fruitful that this charming art yet received. Previous to this powerful auxiliary, the use of the stereoscope was limited to linear geometric designs, the lines of which were submitted to certain rules of a peculiar perspective, which resulted only in monstrosities when the representation of figures in relief was attempted. By the aid of photography, every natural object has since been rendered with striking fidelity, when, however, care has been taken not to exaggerate the effect of perspective, a course mistaken at first, and which for a long time gave publicity to the most grotesque.

The most remarkable effect of the stereoscope applied to photography, has been to cause the complete disappearance of the shocking disproportion in the limbs situated in front of the body, in engendering ærial perspective in the foreground, which, so to speak, remained latent previous to the employment of the optical illusion which forms the fundamental basis of human vision in all its perfection.

This is so true, that the most beautiful photographic proofs, remarkable for their large dimensions, as well as for the combination of all the qualities which constitute the excellence of the drawing cannot fix the attention more than a few seconds without satiating the mind; unless we regard them through the hollow of the hand with one eye, which gives them a stereoscopic effect, and immediately excites a charm. The precise form required by the application of the stereoscope is no detriment, except that the pleasure is limited to one person at a time; but if the visual angle has been properly observed, the picture assumes the amplitude of the natural object, and the eye can range all over it, without fatigue, as happens in viewing the finest photograph of large dimensions with both eyes.

The stereoscope admits of a certain tolerance which permits of the establishing of several categories of pictures; black upon glass and upon paper; colored, translucent, and, lastly, with luminous points added by the hand, which represent, ill or well, the effect of gas lights. and illuminations.

Mr. Breese for one has succeeded, with the aid of an ingenious artifice, in representing moonlight views, although it is now shown that in these pictures the moon has been made to produce its image afterwards. Every means are good, provided they result in the production of illusion, as the works of the greatest artists have no other origin. This brings us to the description of certain artifices which appear to me not to have yet been employed.

In proofs obtained by long exposure, the sky is always uniform on account of the extreme mobility of the clouds, and no medium exists between a uniform sky and a sky supplied with its natural clouds; this very often necessitates the covering of the sky with an opaque coating, from which results very great difficulty in following with the pencil the very delicate outline of objects projecting against the sky; so that this coarse kind of plastering almost always spoils the proofs by rendering this stratagem evident to the least practised eye, on account of the deviations, which are never identical in the two proofs. The method I now proceed to describe appears to me to be susceptible of creating a new kind of sky intermediate between the uniform skies and the natural skies, and which is very easily executed.

It would, for instance, be very easy for a painter to represent the clouds upon a negative with a uniform sky, already slightly marbled by the trace of clouds, by making to act upon this sky a little brush of such degree of stiffness as to gradually thin the film of reduced silver without tearing it; but to produce clouds identically the same upon two proofs by separate operations, will be impracticable, and the eyes applied to the steroscope will not fail to recognise the discrepancy. But if we mount two similar brushes on a horizontal bar, fixed at a given distance from each other, it is evident that upon putting the two brushes in motion, they will act simultaneously, and if kept in the same horizontal line, the work will be found identically the same on both proofs and the distances will be regulated as in all the rest of the picture. It is only clouds that are suited to this kind of work, because of their cottony nature; and besides the facility of execution, this modification of the skies will give a result often more artistic than the uniform flat skies, plastered in with great difficulty in chrome yellow or india ink.

For illuminated stereoscopes, the outline of the spaces to be cleared is distinctly marked upon the picture by gas lights themselves, and when they are few in number the operation is easy and successful; but if the subject is an illumination or a firework, the human hand becomes powerless; still, in the production of the effects of light, these two effects are among the finest aud most worthy to be represented.

The light of gas-burners is fixed as quickly as can be desired, the light of a firework is instantly reproduced; what is indispensable to success is to make use of the artifice employed by Mr. Breese for representing the moon, which, moreover, is that which I have employed upwards of twenty years to obtain gas-lights in lamps at the time of the daguerreotype.

The conditions to be observed are : First, to obtain a very weak proof, which is very easily done. Second, to mask the sky. Third to await the coming of night to obtain the luminous points, and, unmasking the object anew. It is evident that we must operate with dry collodion, while during the interval the apparatus must be kept immovable, and that to wash and unmask the sky, we cannot dispense with employing a movable screen of tissue placed in front of, and at sufficient distance from the objective.

For a firework, the sky cannot be too dark, as being the ground upon which the design must be subsequently displayed. By combining these arrangements, very curious effects may be obtained with a high degree of perfection, and which will come out in the printing, without the necessity, as in the old method, of operating upon each proof with manual labor, which, moreover, in these two cases would be impracticable.—*La Lumière.*

Remarks on the Tannin Process.

BY GEORGE DAWSON.

[Read at a meeting of the Edinburgh Photographic Society, Oct. 5th, 1864.]

In introducing to your notice the subject of tannin dry plates, for discussion this evening, I am actuated by a desire to reopen for your consideration, a question which is now, perhaps, more than ever occupying the attention of scientific photographers; and also by the hope of being able to enlist the co-operation of the members of this Society in perfecting a process which, in my opinion, will eventually supersede all others of the same class. I am aware that there is a general predilection among the Edinburgh photographic brotherhood for other dry processes, such as those of the "gin-and-water" and "beer" classes, which, however valuable they may be in respect to simplicity and uniformity of action in the preservation or sensitising of dry plates, have, nevertheless, the disadvantage of being less easily impressed by the actinic rays, not to speak of the danger incurred of great waste of solution withdrawn from its legitimate purpose.

The few remarks I have to make will, I fear, contain nothing new to most of your members, my experiments and practice having been directed not so much to original researches in the tannin process as to the confirmation and, when the results have been found promising, to the elucidation of those of others. I shall, therefore, in the hope that my observations may be of use to amateurs, only briefly notice those conditions and modes of procedure which appear to me to be the best for securing certainty of success in the hands of those who have only occasionally an opportunity of a field day with dry plates, and who prefer working with their ordinary materials.

Great rapidity, combined with certainty, according to my experience, cannot be obtained except by a combination of favorable circumstances, many of which have not been accurately ascertained and are, therefore, not under control. Under such conditions the chances of failure are very great, and, although now and then very rapid and good results can be obtained by certain modifications of collodion and developer, I would advise those who have a desire to obtain twelve good negatives from as many taunin plates to prepare them much in the way originally proposed by Major Russell.

In the January numbers of the *British Journal of Photography* I described a modification of his process, or rather of his method of working it, by which some complications which I considered unnecessary were avoided. With a collodion prepared by the formula there given I found there was no necessity for a substratum of gelatine, India-rubber, or any other substance to enable it to adhere firmly to the glass, even when using plates as large as 12 × 10. But, as amateurs have not always the convenience, or often do not wish to undergo the "fash" of making their own collodion they may use with safety, for dry plates up to 10 × 8, almost any of the bromo-iodised samples of collodion now in the market without any preliminary coating, provided they manipulate with care and dexterity. The films, it is true, will be less sensitive than if a greater proportion of bromide were used; but that disadvantage is compensated for by their greater certainty. I would summarise a really good and sure, but not rapid, tannin process for an amateur who occasionaily manipulates wet plates, and who hates complications. Thus :—

Coat the plate, after being thoroughly cleaned, with a good sample of bromo-iodised collodion, used for the wet process; allow to set rather longer than usual; immerse in the ordinary nitrate bath till fully sensitised, but not longer; drain well, and place in a dipping bath or porcelain dish, containing distilled or filtered rain water, for five minutes; remove into another dish of spring or river water for the same time, and so on through four or five changes of water; drain for a minute or two; then pour on and off several times a ten-grain solution of tannin and stand up to dry in a dark place. With four and a-half inch focussed lenses, one-eighth inch stop, expose in sunshine from one to five minutes, according to the amount of actinic light reflected from the object. Before development run a camel's-hair brush dipped in spiri varnish round the edge of the film, to the depth of about one-eighth of an inch, then moisten with alcohol (not methylated) and distilled water equal parts; wash under a gently flowing tap till all appearance of oily lines have disappeared, and develope by Major Russell's formula, or by the following, which may be quickly prepared for the occasion :—

Pyrogallic acid	2 grains.
Distilled water	1 ounce.
Citric acid	1 grain.

Pour *quant. suff.* of this solution on and off the plate two or three times and then add to the same solution in the developing glass one drop of a thirty-grain solution of nitrate of silver, containing one-quarter of its bulk of acetic acid. Pour on again : if the image starts out immediately the plate has been over-exposed. In that case there is still a remedy by adding a few drops of a strong solution of citric acid to the developer, and then continuing the development as before. But should the details be slow in making their appearance—I mean by slow after about a minute—then add a drop or two more of the silver. In this way the development of an under or an over-exposed tannin plate is much more under control than it can possibly be in the wet process, where an excess of the nitrate is already on the surface.

Fix and wash as usual.

Sources of Failure.—Little danger need be feared from the collodion and nitrate bath, provided they work well with the wet process. In the washing, failure may arise from its being carried too far or not far enough. It is absolutely necessary that the whole of the free nitrate should be removed, but the washing must not be carried so far as to remove from the back of the film the whole of the soluble iodides and bromides, which have not been decomposed by the nitrate of silver. Major Russell was the first to call attention to this, and to show that, in order to prevent fogging, a trace—but only a trace—of a soluble haloid salt must be present in the sensitive medium or in the developer, unless, indeed, the bath were excessively acid, in which case great insensitiveness was the result. He also found that an excess of the soluble *iodide* was at least ten times as energetic in restraining the action of light or of the developer as the same amount of *bromide*.

At present Major Russell is engaged in the investigation of this subject in its relation to a bromised collodion with an alkaline developer, and his opinions, so far as they have yet been developed. have been communicated to me; but I should only be anticipating him were I to enter into the question at length here.

The tannin solution is of great importance. If the tannin be pure it is only necessary to dissolve ten grains(two or three grains more or less do not seem to make much difference) in one ounce of distilled water, filter, and add one drachm of alcohol, in order that it may penetrate the film more readily, and apply it to the plate at once; but many failures which are continually coming under my notice, arise from impurities in this article. Some samples I have had, with which, if applied to the plate immediately after solution, it was impossible to get clean negatives by any mode of treatment, yet this same tannin, after solution in three parts water and one of alcohol, and being allowed to stand for a week or two, deposited a copious curdy precipitate, and was then, after filtration, quite as good as the best specimens.

Another source of failure arises from the method of applying the tannin solution. It should be allowed abundance of time to penetrate the collodion, otherwise the film will be unequally acted upon, and wavy lines of uneven development will be the result. It is really of no importance whether the tannin be washed off immediately after its application or not, either as regards sensitiveness or certainty, if fresh portions of the solution be used for each plate; but if the same portion be used for many plates, it is then better to wash it off before setting them aside to dry.

The above are the chief sources of failure which are likely to be met with in what I may designate the "slow and sure tannin" process; but with proper precautions, and a little experience, they may easily be avoided, and little risk of failure need be anticipated, provided the plates, while being prepared, are well protected from dust, and allowed to dry spontaneously. Drying by artificial heat may be had recourse to, but in that case the collodion, by being too much desiccated, loses much of its sensitiveness. If dried in this way, therefore, the plate should be allowed to remain for some hours exposed in the dark to the ordinary temperature and moisture of the atmosphere, in order to regain its sensitiveness before it is exposed in the camera.

I do not purpose at present to discuss the rapid processes with simply bromised collodion and alkaline developer. In my hands both Mr. Sutton's and Major Russell's methods have proved very uncertain, for the reason previously mentioned, viz., our ignorance of many of the essential conditions of success When these have been experimentally ascertained to a nicety, there is no reason to doubt that a dry tannin, prepared from bromised collodion, or from collodion containing a large excess of bromide in proportion to the iodide, will approach, if not equal, wet plates, both as respects sensitiveness and certainty.

A Cheap and Simple Method of Preparing Paper for Photographic Drawings, Salts of Silver being dispensed with.

BY M. PONTON.

While attempting to prepare paper with the chromate of silver, for which purpose I used first the chromate of potash, and then the bichromate of that alkali, I discovered that when paper was immersed in the bichromate of potash alone it was powerfully acted upon by the sun's rays. It accordingly occurred to me to try paper so prepared to obtain drawings, though I did not at first see how they were to be fixed. The result exceeded my expectations. When an object is laid in the usual way upon this paper the portions exposed to light speedily become tawny, passing more or less into a deep orange, according to the strength of the solution and the intensity of the light. The portion covered by the object retains the original bright yellow tint which it had before exposure, and the object is thus represented yellow on an orange ground, there being several gradations of shade or tint, according to the greater or less degree of transparency in the different parts of the object.

In this state, of course, the drawing, though very beautifnl, is evanescent. To fix it, all that is required is careful immersion in water, when it will be found that those portions of the salt which have not been acted on by the light are rapidly dissolved out, while those parts which have been exposed to the light are completely fixed in the paper. By this second process the object is obtained white upon an orange ground, and is quite permanent. If exposed for many hours together to strong sunshine the color of the ground is apt to lose in depth, but not more so than most other coloring matters.

This action of light upon the bichromate of potash differs from that upon salts of silver. Those of the latter which are blackened by light, are of themselves insoluble in water, and it is difficult to impregnate paper with them in an equable manner. The blackening seems to be caused by the formation of oxide of silver. In the case of the bichromate of potash, again, that salt is exceedingly soluble, and paper can be easily saturated with it. The agency of the light not only changes its color, but deprives it of solubility, thus rendering it fixed in the paper. This action appears to me to consist in the disengagement of free chromic acid, which is of a deep red color, and which seems to combine with the paper. This is rendered more probable from the circumstances that the neutral chromate exhibits no similar change.

The active power of the light in this instance resides principally in the violet rays, as is the case with the blackening of the salts of silver. To demonstrate this, three similar flat bottles were filled—one with ammoniuret of copper, which transmits the violet rays; the second with bichromate of potash, transmitting the yellow rays; and the third with tincture of iodine, transmitting the red rays. The paper was readily acted on through the first, but scarcely, if it all, through the second and third, although much more light passed through the bottle filled with bichromate of potash, than through the one filled with ammoniuret of copper.

The best mode of preparing paper with bichromate of potash is to use a saturated solution of that salt, soak the paper well in it, and then dry it rapidly at a brisk fire, excluding it from daylight. Paper thus prepared acquires a deep orange tint on exposure to the sun. If the solution be less strong, or the drying less rapid, the color will not be so deep.

A pleasing variety may be made by using sulphate of indigo along with the bichromate of potash, the color of the object and of the paper being then of different shades of green. In this way also an object may be represented of a darker shade than the ground.

Paper prepared with bichromate of potash is equally sensitive with most of the papers prepared with salts of silver, though inferior to some of them. It is not sufficiently sensitive to the camera obscura, but answers quite well for taking drawings from dried plants, or for copying prints, &c. Its great recommendation is its cheapness and the facility with which it can be prepared. The price of the bichromate of potash is two shillings and sixpence per pound; whereas of the nitrate of silver only half an ounce could be obtained for that sum. The preparing of the paper with the salts of silver is a work of extreme nicety; whereas both the preparing of the paper with the bichromate of potash and the subsequent fixing of the image are matters of great simplicity, and I am, therefore, hopeful that this method may be found of considerable practical utility in aiding the operations of the lithographer.—[Transactions of the Scottish Society of Arrts, for 1830.]

A New System of Printing.

We are abuot to bring under the attention of our readers, a new system of printing, different in principle and detail from any other of which we know, and one which may probably revolutionize the whole art of printing, by the press as well as by photography. It is distinctly different from any system of press printfng, and from any system of photographic printing, although it possesses analogies to both. The principle is so novel, and its development may be so important, that we must ask the patient and careful attention of our readers, whilst we endeavor to explain the mode of working and its results.

Before doing this, however, it may be well to state that the originator of the system we are about to describe is Mr. J. W. Swan, whose carbon process is now before the public. When Mr. Swan was in London, in April last, for the purpose of reading his paper before the Photographic Society, he described to us, in confidence, certain experiments upon which he was engaged, for the purpose of securing efficient press printing processes by the aid of photography. The system in question was one of these; but he wished to bring it to a successful practical issue before publishing either the idea or its details. He has favored us from time to time with examples of progress, but has not yet, from pressure of other duties, had time to fully develop the process. A few weeks ago, however, Mr. Walter Woodbury, of Manchester, called upon us for the purpose of showfng us examples of his experiments in producing photopraphs in relievo and intaglio, and transparencies in porcelain, obtained by applying the same principle. In the course of our interview, he produced a rough print obtained by the very method which Mr. Swan had described to us some months previously. Thus the same idea had occurred to two gentlemen independently. Mr. Woodbury did not, however, regard the principle as capable of very successful application, whilst Mr. Swan regards it as of the utmost importance, and capable of the most valuable development. He has now removed the seal of privacy, and we are at liberty to publish the idea, and describe such results as we have seen produced by the two gentlemen named.

We now again invoke the attention of our readers. There are five distinct modes of printing or multiplying from a cliche, pictures, or designs. *Block printing*, or the method of producing impressions by inking a block with raised surfaces, and obtaining a copy of such raised surfaces by pressure, upon paper or other fabric, as in wood engraving, &c. *Intaglio printing*, or the method of producing impressions by filling up with ink lines or hollows in a metal plate, then cleaning the surface and obtaining a copy of the lines and hollows by pressure, which causes the ink to be transferred to paper or other fabrics, as in copper-plate printing. *Lithographic printing*, or the method of producing impressions by applying ink to a design upon a stone, the design having an affinity for the ink, whilst the other portion of the surface repels the ink, the design so inked being obtained upon paper by pressure. *Photographic printing*, or the method of producing an image by the action of light through a negative, upon a surface which is darkened by the action of light. And *Carbon printing*, or the method of producing an image by the action of light through a negative, upon a soluble substance which is rendered insoluble by the action of light, and so imprisoning any coloring matter incorporated with it, and thus yielding a design in such color.

In each of the three first-named methods, gradation of tint is obtained on the same principle; the ink applied is opaque, and the thinnest as well as the thickest layer of it should be black. The gradation, or variation, in depth in the image is obtained by the design being formed of lines or dots : when the lines or dots are large and very close to each other, a very deep tint is produced; an absence of either lines or dots to receive the ink leaves the paper white, and a continuous surface to receive the ink produces a breadth of black. But in no case is there gradation of tint in a continuous surface, or what is termed a flat tint. In photographic printing, gradation is obtained on a different principle : lines or dots, hatching or stippling, are unnecessary. The gradation is obtained by degrees of depth in a continuous tint, like "washing" in water-color drawing. It is the nature of this gradation, and its dissimilarity from that employed in ordinary printing, which has been the great difficulty in obtaining successful press photography.

In carbon printing, gradation is obtained without lines or dots, as in ordinary photographic printing, but the method of securing that gradation is again essentially different. It is obtained here by different thicknesses of a colored translucent material on a white ground. The deepest blacks consist of a sufficient thickness of this material to become practically opaque, and cover the white paper upon which it is fixed, without allowing it to show through; the next depth of tint is obtained by a slighter thickness, which allows a trace of white to show through, producing the effect of deep grey; the other tints by varying thicknesses, the thinner the layer of the colored translucent medium, the more delicate the tint of grey, as the white ground becomes more and more apparent, gradually merging into the pure white of the ground as the layers become attenuated to nothing. This mode of securing gradation embodies a new principle which has been scarcely sufficiently recognised in treating of carbon printing, and it is of the utmost importance in the process we are about to describe.

The new system of printing consists in a combination of the principle upon which intaglio or copper-plate printing is based, and that upon which the image in carbon printing is obtained. An image in which the shadows are in relief, and the whites depressed, is obtained by exposing bichromated gelatine under a suitable cliche to the action of light, and afterwards to water. The details of the process may be varied, but we need not enter into them here, as the principle is well known. From the gelatine an electrotype is obtained with the lights in relief, and the shadows depressed, as in an engraved copper-plate. This is the block or cliche from which impressions have now to be obtained by mechanical means. It must be borne in mind that the intaglio so obtained represents by degrees of depth the gradations of the image. This intaglio is now to be filled with a thick solution of gelatine, containing Indian ink, or other coloring matter mixed with it; when slightly set, and the surface cleaned as in copper-plate printing, it is placed in contact with paper, the surface of which would be best prepared with gelatine, albumen, or collodion, to prevent it being absorbent; the block is then brought into firm contact by steady heavy pressure. The set gelatine and color will be thus delivered on to the paper, much in the same way that the cook delivers a shape of jelly from its mould. The gelatine and color so delivered on to the paper will in all respects resemble a carbon print. The deepest shadows will consist of a thick opaque layer forming blacks, each gradation from these to white consisting of a thinner layer of the translucent material.

We have confined ourselves here, for simplicity, to a bare elucidation of the principle, and the mode of putting it into practice. It will be seen that, the principle once understood, there are various methods of effecting the end, and using other materials besides gelatine and pigment, and various modes of applying the pressure, and working the mechanical details.

The principle is simple to apply translucent materials to intaglio printing, the intaglio in all cases representing depth of tint by depth of depression. The intaglio may be produced either by photography or may be engraved by hand; but the principle is quite applicable, independent of photography. This is the first method ever devised, we believe, of obtaining real gradation of line or stipple, by mechanical printing, and one which may possibly on further development effect a revolution in art printing generally.

As we have said, it is not simply an idea, but has been put into actual practice, and we have some of the results before us. The print by Mr. Woodbury, although a rough experiment, was to us a very interesting and suggestive result; but Mr. Swan has made greater progress, and secured in small surface a considerable amount of true gradation, delicacy, and sharpness. He has sanguine hopes of obtaining the completest success, and producing perfect pictures, containing true photographic gradation with as much ease and facility as an impression is produced from a copper-plate. We hope shortly to have further details and complete success to chronicle. In the meantime the principle is before our readers.—*Photo. News.*

On a Method of Making a uniform Lime-Toning Bath.

BY F. W. HART.

[Read at a meeting of the South London Photographic Society, Oct. 13.]

The members of this society will pardon me for occupying their first meeting with so trite a subject as that which I have announced; as, without a doubt, they have long since completely overcome the practical difficulties of that toning process generally known as "the chloride of lime bath."

The utility of this and kindred societies, however, must not be lost sight of; for, be it remembered, all have not the same opportunity of debate and exchange of ideas; therefore, even though the subjects we bring forward may be simple in themselves, they may lead to discussions of higher matters, and thanks to our very ably conducted journals, the report is in a few days accessible to those in the most remote quarter of our land, and I might add the world. Still, bearing in mind the objects of this society, let me entreat you, gentlemen, to keep the treasury of the committee overflowing with subjects to be read this session.

Without further digression, we will proceed with this short paper. It is now some six or eight months since we first privately distributed the test papers, to enable us to know if they were generally useful. From reports we have reason to believe they are, and so thought a description of their preparation might be useful. It is as follows:—

Make a solution of—

Iodide of potassium	10 grains.
Water	10 grains.

Then take 25 grains Glenfield starch, and make into a stiff paste, with a few drops of cold water, to this add 10 ounces of boiling water; mix the two solutions, pour into a clean porcelain tray, and immerse sheets of Saxe paper, Takeout, dry, and preserve from the air, as it is well known continued atmospheric action colors papers prepared somewhat similar, which we use for the detection of ozone.

To employ these test papers, the toning bath should be prepared in its full quantity before dipping them in. A very convenient way is to take, say two pints of water, more or less, according to the quantity of prints to be toned, drop in two minims of chloride of lime solution, mix well with a glass rod, and then dip a slip of paper in half way; should the solution not tint the paper, another minim or two may be added, stirred, and a fresh piece of paper dipped in. If now the paper is tinged, to a faint bluish grey, sufficient has been added; if to a decided blue, too much. Thus you see the oft-repeated questions of "how much chloride of lime of the oil shop am I to use?" "what is saturated solution?" &c., &c., are answered. These questions need no longer perplex, it being of no consequence what strength that article may be when purchased, a trial by these test papers will soon tell you how much of that particular solution it is necessary to use. It is advisable that the solution should be cold and tested between small additions, and that it should be conducted in daylight, as delicate tints are not easily seen by artificial light. A strong solution of chlorine destroys the color almost as soon as formed.

Having prepared the bulk of solution as above, I now ascertain if the gold solution is acid; if so it is neutralized by preference with precipitated chalk; and then mixed with the chlorine solution which may contain from one to three grains pure chloride of gold per pint, according to the season, and other circumstances, connected with the character of the negative in giving vigorous or thin prints.

In conclusion, I will just go through the experiments of mixing the chlorine solution, and present you with a few slips of the paper prepared as directed.—*Photo. News.*

Negatives Not to be Sold.

BY M. P. SIMONS.

You will oblige me by publishing in your Journal the few remarks I wish to make upon what I think a very foolish practice some photographers have of selling negatives to their sitters. It is, I am glad to know, confined to only a few establishments, some of this number however are among the leading ones of this country, and I am the more surprised to see men possessing good business qualities doing anything so unbusiness-like as this.

I do not know how it is in London, but I have been told by travelers that the artists of Paris refuse to sell their negatives even to strangers passing through their city, yet this they might do and not be the losers by it.

But with us it is quite different; those who would purchase negatives are mostly our own citizens.

Now let us see for a moment what kind of negatives are wanted. Certainly not of the squinting young lady who, after seeing her *positive*, "positively declares that you have made her look as old as her grandmother, and as stiff as a poker." Nor the young lady whose mouth was perfectly straight before you sat her for a picture, and she knows that her eyes are fellows but you have represented her as having one smaller than the other. She is reasonable enough however, and says she believes that it must be the fault of the day, or the light, or the instrument, or something, anything, but herself; anyhow the pictures are "horrible." Do you suppose that she would buy her negative? no, she would rather have the money back than the few pictures you have made from it, that she might without any further expense, pester some one else in trying to get a handsome picture, forgetting that the sun won't lie. And how is it with the old lady with long and broad white cap strings, whose picture you took so much pains with last week, is she satisfied, would she be willing to pay a dollar (the price charged) for negatives? I am sure not, for she does not like the way you have taken her cap, "it's too thick, and her shawl don't set well, and is rather dark." Besides she is considsidered a very pleasant lady, and you have made her look so sour, or what is just the same thing, you have suffered the sun to do it. Of course, as she says, she knows no one in the world would ever take it to be her likeness, and yet she begs you not to hang it at the door, for she don't like to be exposed to the gaze of everybody on the street, she hasn't that kind of vanity.

Now these are not fancy sketches; I wish they were, I have had too much sad experience of its reality, and I believe that there is no photographer of any experience but will agree with me that the above cited cases are rather under than overdrawn. The two young ladies and the old lady are but the representatives, of a very considerable proportion of our sitters. The fact is, the very negatives we could sell are just the very ones we (if we study our own interest) should not sell. Such, for instance, as you sometimes take of parties who have sat dozens of times before and since, but this time you haue succeeded in catching the beautiful, for which you deserve great praise. In this case the sun did its full duty, and seemed inclined to fib a little.

Now are we to sell such negatives as these for one dollar, to be carried off to be printed by an outsider (who runs no risk whatever of having the prints thrown upon his hands), and who will print them for half or less than half what you would who took so much time and pains to make the sittings.

Portrait painters are not asked to sell an outline, or drawing, to be carried off to be painted by another because he would do it a little cheaper. And why do we, or rather some of us, encourage such an unreasonable request, why not have an understanding among ourselves about this matter and refuse positively in the future not to sell negatives whether the original is deceased or not; if deceeased, we can furnish as good prints from it as anyone else and I should think take as good care of the negative.

Now this is not an arbitrary measure, but is one of those kind of reforms which benefit some without doing injustice to any. It is democratic in the broadest sense of the word. It may be argued that if my advice is well followed that the photographers who now only print, will be forced to put in a skylight and make other necessary arrangements for taking negatives for themselves. This is just what I would desire; they would soon learn that it is no small matter to make satisfactory negatives, such as they have been printing from for a mere song, and they would be the very first to carry out my views upon this subject.

Mr. Editor, I consider this an important subject, I believe it to be a growing evil, and the sooner stopped the better for the profession at large.

PHILADELPHIA, Pa., Nov. 1, 1864.

Concerning Sharpness.

WE were entertained a few days ago by a lively discussion which took place between two of our photographic friends as to the relative merits and demerits of sharpness in negatives and prints. We wished exceedingly, just at the moment, that we were in possession of the phonographer's skill in catching the "winged words" as they flew backwards and forwards; we are sure it would have furnished an amusing report for our readers. As it is, we must content ourselves with detailing the principal arguments *pro* and *con*.

The discussion arose concerning a picture which Mr. A. remarked was full of atmospheric effect; to which Mr. B. responded, after a hasty glance at the picture, that that was what he was accustomed to call a want of sharpness. Mr. A. thereupon asserted that he considered it a serious fault , and one that showed a great want of taste, for an artist to produce a picture, whether portrait or landscape, sharper than could be seen in nature. Mr. B. replied that it was by no means easy or common to produce such a picture; that the human eye, in a fair state of preservation, saw a great deal more and a great deal further than was generally supposed, and that the sharpest paper print, if it preserved the foreground, would not give a background any sharper than could be seen on a clear day by looking out of the window upon any extended view; and that, as to portraits, small size or enlarged, that were supposed to be injured by excess of sharpness, it would be found by inspection that the light and shade had been badly managed, bringing into too vigorous relief defects which need not have been made so prominent, but that in all cases where what was intrinsically beautiful or delicate was to be depicted, the sharper it was delineated the better would be the effect.

Mr. A. replied that this was altogether contrary to his idea of Art; the true plan in producing a work of art, such as a landscape, was to depict the central or principal objects carefully and sharply but so to arrange all the accessories as to satisfy the eye in a general way, and not to call it away from the contemplation of the main object by an undue refinement in the execution of that which was merely subservient. Mr. B. retorted that such a theory might do very well for what was called Art, but that it would not stand the test a moment when it was applied to Nature. Nature finished all her productions, principal and secondary, *ad unguem;* that the tree in the background whose branches sharply cut the sky was finished as carefully as the flowers and blades of grass in the immediate foreground; and that the reason Art had assumed a lower position was because of her incapacity to compete with Nature, but now that photography had given us the power of reproducing nature with almost perfect accuracy, there was no reason why it should not be done. Mr. A. replied to this by denying that Nature and Art were so greatly in disaccord. True, Art could not produce the infinite detail of Nature, but it was not necessary that it should be done. Nature herself, by means of the atmosphere, softened and mellowed the extreme distance, so that sharpness disappeared except in the case of very prominent and bold objects, such as the outlines of a mountain painted against the sky. Nature had also deprived us of the power to see everything with the same distinctness. If we fastened our attention on one thing, our perception of the surrounding objects was indistinct. the whole scene could not bo presented to us equally sharp and clear at the same time. Mr. B. again retorted that the same reasoning would apply equally well to the sharpest picture; the extreme distance would, of course, lack much of the sharpness apparent in the foreground, but this was no reason why we should not reproduce it as accurately as possible. And so also, in examining a picture, the part to which we directed our attention would be more distinctly seen than the remaining portion of it to which we gave no attention; but in Nature, when we wished to give our observation to the secondary objects, or examine the view step by step, the picture in all its details was there, ready for our inspectioe. And so it should be in a photograph, the sharp details ought to be preserved, for they would certainly be wanted when the central portion of the picture had been sufficiently contemplated.

Mr. A. still appeared to be unconvinced by the arguments of Mr. B., when the latter finally observed that the fact was, that in all paper photographs the loss of detailall over the picture was so great—a matter easily verified by comparing the print with the negative under a microscope—that he really thought Mr. A. was unreasonable in demanding still more in order to satisfy the requirements of a pet theory. Mr. A. smiled at this and acknowledged that whatever he might affirm about positives, he was willing to concede that it was very desirable to secure a sharp negative; and, with this approach to an agreement—leaving the main question undecided—the friends separated.

As we did not assume the office of umpire between our friends during the actual debate, so now we shall content ourselves with this report of the main features of it. Our readers may form their own conclusions. Our opinion can be given on some other occasion. —*Brit. Journ.*

On the Comparative Permanency of some Photographic Processes.

The impulse given to the progress of photographic printing by the new or modified processes which have recently been described in this Journal, afford healthy symptoms of a great future for our art. Mr. Swan's announcement seems first to have stimulated new inquiry and investigation, chiefly arising from the interest excited by the beautiful picture he was enabled to exhibit, which thoroughly attested the capabilities of his carbon process. Then followed Mr. Pouncey's improvements in the same direction and now we have the "Wothlytype" or uranium process, brought prominently under our notice in a way which must command the attention of every one interested in the progress of photographic art-science.

That the question of *permanent* photographic prints is now absorbing the attention of a large portion of our artistic brethren, who are jealous of their reputation and shrink from the idea of the adverse opinion of posterity, is sufficiently evidenced by the numerous inquiries and communications we are constantly receiving on the subject; and that imperfect knowledge to a considerable degree still prevails among several of our ordinary correspondents, is also very evident from their letters.

In the following remarks we shall therefore state, as briefly as we can, the relative merits of the different printing processes now in vogue, as respects the permanency and simplicity of manipulation; and we may add that our conclusions are not theoretical, but have been arrived at, after long and careful experiment.

Mr. Swan's process, beautiful as the results unquestionably are, still requires great improvement and simplification before it can become practically and commercially useful to photographers. Under the most favorable conditions it is both uncertain and extremely difficult of manipulation. Its permanency, so far as the carbon is concerned, may be said to be assured; but unfortunately —and we speak from considerable experience—of all the many pictures we have produced by this process, there is not one which we have submitted to the experiment that has not cracked and partly peeled off from the mount to which it was attached, after less than a month's exposure in a warm and dry atmosphere. We had at one time supposed that this failure must have been owing to our own faulty manipulation; but we have since then noticed a 10 × 8 picture, printed from one of Mr. Wilson's negatives by Mr. Swan himself, and exhibited in a shop window on the shaded side of the Strand, which has yielded to the same destructive influence, whatever that may be. It was interesting to examine this picture with care, because it corroborates our own experience, and seems to have failed from the same cause, viz., the contraction of the collodion support. Probably means might be devised to obviate this source of failure. In the meantime it is a serious obstacle—apart from other considerations of uncertainty and difficulty of manipulation—to the general adoption of Mr. Swan's process.

Mr. Pouncy's method by means of printers' ink, although scarcely giving the brilliancy and sharpness of Mr. Swan's, is more promising, from its greater simplicity and less liability to failure. The chief objection, viz., the extreme insensitiveness of the carbon tissue to actinic rays, seems now, according to his own statement —for, unfortunately, we missed the opportunity of witnessing his experiments—to have been overcome, probably, by a method which we suggested to him some months ago, of floating the carbon side of the tissue on a weak solution of a chromic salt and drying previous to use. If he has succeeded, as he states, in reducing the time of exposure to that of an ordinary silvered paper, it must, we think, haue been by incorporating a salt of that class, in some way, with the carbon. A very important advantage his process possesses over Mr. Swan's, consists in the entire absence of any tendency in the pictures to crack and peel off, when exposed for a lengthened period to sunshine. In order to test this, several pictures were pinned up beside others taken by Mr. Swan's method, and exposed, for over two months, to the direct rays of the sun in a glass house, where they still remain as perfect as they were at first, while those by the Swan process have cracked and become reticulated in less than half the time.

The "Wothlytpe," or the printing process by means of the salts of uranium, has been presented to the public by recognised photographic authorities, under circumstances which are apt to prepossess us in its favor; but as the details are still kept secret, and we have not had an opportunity of testing the pictures, we prefer restraining our enthusiasm till we have ascertained more about them, for then we shall be in a better position to pass judgment *pro aut contra*, as the case may be. In favor of this process it may at once be stated that the manipulations are extremely easy, and without complication; and further, that the results are very beautiful—at least as fine as the best silver prints. Permanency, in the widest sense of the word, we should never think of predicting for, or expecting to be a characteristic of, uranium pictures; for although that metal is not oxydised by contact with air or moisture, it has an extraordinary affinity for sulphur which abounds in the air of large towns and in rooms lighted by gas flame. We may, therefore, set aside the idea of the indestructibility of such pictures as a thing very improbable indeed, and a question which yet remains to be solved. Theory is altogether opposed to it, but practice may possibly enlighten us otherwise.

We now proceed to draw a brief comparison between these processes and the ordinary silver printing, in relation to their robable permanency. In the Swan-Fargier and Pouncy methods the coloring matter, carbon, which constitutes the image, is in itself indestructible by all atmospheric and chemical menstrua, except fire, and even then only in the presence of oxygen. Hence such pictures may in one sense be said to be permanent; but then comes the question—Is the tissue or mount which is necessary for the support of the carbon also indestructible by the ordinary atmospheric influences? Collodion, which constitutes an important part of the Swan-Fargier supporting tissue, is very liable to be acted on by hygrometric changes of the air, and to this cause is attributable the reticulated cracks, which soon show themselves in pictures printed by this process, after exposure for but a short time to a warm and dry atmosphere. Having experimented very frequently on the nature of collodion tissues, we have also no doubt that a lengthened exposure of such prints in moist air would, in like manner, prove destructive, not to the carbon itself, but to the substance to which it is attached; and this practically involves the destruction of the other.

(Concluded in next number.)

Editorial Department.

——-The admirable paper on page 225 is a relic of the early days of our art well worthy of preservation. It was read before the Royal Scottish Society of Arts, May 29th, 1830; and was subsequently printed in the transactions of the Society, and in Jamieson's Edinburgh Journal of Science; until the present year we are not aware that the paper has had any other publication. The process in its day was a wonderfully simple, cheap and sure realization of the hopes of the many unsuccessful experimenters in search of a photographic art. By it pictures might be made which were truthful in form and light and shade, while they might be exposed in sunlight with impunity. But the Daguerreotype and Mr. Talbot's processes shortly made it of little importance; its existence was almost forgotten.

The name of Mungo Ponton must be rescued from oblivion. He was the first to discover and demonstrate the photographic properties of the bichromates. He laid the foundation for the successful processes of photography in which carbon and printing ink are employed. Without a knowledge of the effect of light on the bichromates, we should not have have had the photolithography and carbon printing which have been approved

In 1840, Joseph Dixon, then residing in Taunton, Mass., used the bichromate of potash with gum arabic on the lithographic stone, and was nearly making photolithography a practical art at that early day; it was left to Poitevin, Cutting and Bradford, James, and Osborne, to render the process perfect. In 1853 Talbot published a process in which he used bichromates and gelatine in a process of photographic engraving on metal plates. At about the same time Poitevin invented the art of carbon printing.

Besides these names above mentioned there are many others which have become celebrated for their connection with the improvements which have grown out of that original discovery of Mungo Ponton.

——The wife of the Editor has recently been presented with a superb photograph album. It is designed to hold 200 pictures, and all of the immediate relatives and friends whose portraits would be appropriate in the book do not number half that figure. A friend suggests that we should mention these facts, and also that we gently insinuate that it would be a graceful thing if the subscribers of the Journal would help to fill up the pages now blank. We approve the kind interference of this friend, and acting on it, placed at the disposal of the lady our collection of cards, and there have been selected as gems to adorn the book some of the productions of J. W, Black, of Boston ; S. C. Landon, of Milford, Conn.; H. K. Averill, Jr., of Plattsburgh, N. Y.; S. J. Thompson, of Albany ; Alex. Hesler, and J. Carbutt, of Chicago ; J. E. Whitney, of St. Paul, Minn.; J F. Ryder, of Cleveland, and others. There are many pages which are waiting for interesting bits of scenery, portraits of children, and handsome women, etc. Have we said too much?

——S. R. Divine, the author of the popular treatise on Photography, has recently been appointed to the professorship of chemistry in the Hygeio-Therapeutic Medical College of this city,—a well deserved tribute to the ability of a rising man. In the name of his numerous friends who are readers of this Journal we offer congratulations on Professor Divine's accession to his new dignity.

Minor Correspondence.

C. R. P., of Tenn.—"I wish a little advice as regards using mercury as an intensifier. In what manner is it best used? I have noticed negatives intensified by mercury, and afterwards treated with aqua ammonia, do not retain their intensity? Please explain the cause, and how obviated." ....A plain solution of bichloride is probably more used than any other preparation. The bichloride with iodide or bromide of potassium is a favorite with many ; sulph. potass. followed by the bichloride is also highly recommended. ..It seems to be the fact that negatives strengthened with mercury *in any form* will fade. We know of no way to obviate it. The fading is probably the result of a crystalization of the compound of silver and mercury on the plate. Mercury should only be used on negatives which are not intended for preservation.

J. M. B., of Mass.—"Tell me through the Journal, or otherwise, how to make liquid gold for toning ; and also is there any advantage in economy or otherwise to prepare it in the liquid form instead of the dry? Will it pay to buy collodion formula at five dollars each, even if the collodion appears from trial to work well." ....Dissolve 15 grs. of dry chloride of gold in one drachm of water, and you have the liquid chloride. We do not see where any advantage or economy comes in. ..It would not pay us to buy receipts for collodion. If your five dollars burn in your pocket, an investment in receipts might be wiser than an investment in bad liquor.

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[NEW SERIES.]

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New Printing Processes.

Our readers will remember that some few years ago Mr. C. Burnett, of Edinburgh, published in this Journal, at the time when it was the organ of the Photographic Society of Scotland, a new printing process with a salt of uranium, in which no fixing agent is required. The process was simply this :—

A sheet of paper is immersed in a strong aqueous solution of nitrate of uranium, dried in the dark and exposed under a negative. A very pale positive print is thus obtained, of a brownish color upon a yellow ground. It is then washed, in order to remove the altered uranic salt; and then toned or developed to a rich dark color, in either of the following ways : by immersion in a solution of chloride of gold which turns it a deep slate color; or, by immersion in a solution of nitrate of silver, which turns it a deep chocolate brown. After which, a simple but thorough washing in water is supposed to complete the process.

At the time when this new method of printing was proposed, we took it up with much interest, and made some experiments in it, which suggested a new and even simpler method of working than Mr. Burnett's. But the prints thus obtained, although very fine in detail and gradation, were not so vigorous as silver prints upon plain paper obtained by the gallic acid development, and we did not therefore publish our experiments or pursue the matter further.

Our attention has however been recalled to this subject by some crude particulars which have lately been given in the *News*, and

British Journal, of a new printing process which has lately been patented by a Belgian photographer, M. Wothly, whose name will be familiar to our readers as the producer of some remarkably fine enlarged portraits by a secret method, in which no hyposulphite of soda is used. The full particulars of this patented process will not be made known for some months, that is, until the complete specification of the patent is filed; and in the imperfect knowledge which at present exists about it, our readers may be interested in hearing of our own doings with uranium as a printing agent.

An aqueous solution of nitrate of uranim may be mixed either with an aqueous solution of chloride of gold, or of nitrate of silver, without producing turbidity or decomposition; and thus two very simple new printing processes arise. The first may be called the Auro-Uranium Process; and the Argento-Uranium Process.

1st. *The Auro-Uranium Printing Process.*—Mix together a strong aqueous solution of nitrate of uranium, and a solution of chloride of gold. We cannot give exact proportions at present, but the vigor of the print seems to depend upon using strong solutions. Immerse a sheet of plain paper in the mixture, and hang it up to dry in the dark. When dry, expose it to light under a negative. A fine dark print of a deep slate color will be quickly obtained. It only now remains to wash this print thoroughly in water, and the operation is complete; no fixing or toning being necessary.

We know of no simpler photographic process than this; and the image being formed of metallic gold is no doubt permanent.

2nd. *The Argento-Uranium Printing Process.*—Mix together two strong aqueous solutions of nitrate of silver and nitrate of uranium. Immerse a sheet of paper in the mixture, dry it in the dark, and expose it to light under a negative. It darkens rapidly to a rich warm bistre, or chocolate tint. When sufficiently printed, wash it in water, and the operation is complete.

Should the paper contain any trace of a chloride, it would be necessary to fix the print by immersing it in a weak solution of sulpho-cyanide of potassium. Otherwise a thorough washing with water will be sufficient to prevent discoloration of the whites to any injurious extant.

In Mr. Burnett's original process there was this great defect, viz., that the image on its removal from the printing frame is so pale as to afford but an imperfect clue to the proper exposure, and thus frequent failures occur. But in the modified processes which we suggest, no such defect exists. As no development is required you have merely to watch the printing in the usual way, and stop it when you see that it has gone far enough.

The tone of the print is modified by the state of dampness of the paper. For solar camera enlargements we believe it would be better to expose the sensitive paper wet.

Albumenized paper may be used in the second process, but the albumen should not contain salt. If a piece of common salted albumenized paper is excited by floatation upon the mixed solutions of silver and uranium, the print is rather grey and dull; but if the paper be wetted it darkens very quickly to a rich, vigorous red tint.

We will next describe some uranium printing processes in which collodion may be made the vehicle of the sensitive salt.

Nitrate of uranium is freely soluble in alcohol, and may therefore be added in large quantity to collodion. If a piece of glass be coated with Uranic collodion, and exposed, when dry, under a negative, the image, developed either with nitrate of silver, or chloride of gold, is pale and worthless.

Again, if chloride of gold be added to this collodion, a violet-colored visible image is produced, which may be intensified after it is washed, by the application of a solution of nitrate of silver and the color changed from a cold blue, to a rich warm brown.

If nitrate of silver be added to Uranic collodion, a brown image is produced of considerable depth and intensity. The collodion so prepared had better be spread upon paper. (It is just possible that this may be M. Wothly's patented process; if so, we fear his patent is not worth the paper on which it is prrinted.) The quantity of silver salt which can be dissolved in the collodion, in this process, will of course depend upon the quantity of water which the collodion contains,—4 grs. of nitrate of silver can be dissolved in an ounce of common photographic collodion; but if the collodion is to be used for a printing purpose, it may contain more water, and therefore more silver.

Instead of adding the silver or gold salt to the Uranic collodion, a plate or paper may be coated with that collodion, then immersed in a solution either of chloride of gold or nitrate of silver, and dried. The other operations to be the same as before.

Positive prints obtained upon glass in the manner described, may either be exhibited as transparencies, or the film may be removed upon a piece of wet blotting paper, and transferred to a gelatinized paper or card,—the image being then non-reversed Or, instead of glass, sheets of porcelain or ivory may be used as the support to the film.

In all cases of prints upon plain paper, whether obtained in the usual way, or by any of the processes now described, it is of great advantage to apply to the finished print the beautifying varnish which restores its depth and vigor without imparting any glaze,—and to which we have given the name of Print Varnish.

Our impression is that M. Wothly's process consists in the use of a collodion containing nitrate of uranium and chloride of platinum or palladium. We have been invited by the Company to go and witness the process at their rooms, No. 213 Regent Street, and we are going to London, in a day or two, for that express purpose. Our readers shall have early information as to the result of our visit.

It appears that this process is to be called "Wothlytypie" (what a name!) and that the patent right for England has been bought by Colonel Stuart Wortley and Mr. Warren Vernon, and that it is to be worked commercially by the United Photographic Association, who will grant licences to practice it, and sell collodion ready prepared, as well as the sensitized paper. For our own part we believe the present printing process to be in a highly satisfactory state, and we certainly do not advise our readers to dabble in a paper printing process in which collodion is used; chiefly because such a practice is likely to injure their health, if carried on extensively. It is bad enough to have to use collodion for negatives, without introducing it into printing, except on a small scale, or for very choice purposes.—Ed. *Photo. Notes, Oct.* 15.

The Editor of *Notes,* in his Journal of Nov. 1st, says :—

We have been to see the new Wothlytype prints, at the rooms of the United Photographic Association, in Regent Street, and a finer display of specimens it is impossible to imagine. The negatives, which are mostly portraits, have been selected with great judgment, and the prints exactly resemble silver ones in color and general effect, as far as we could judge from prints which are exhibited behind the glass of a frame in which they are mounted. The particulars of the new process will be published as soon as the foreign patents are completed, and not improbably therefore in the course of a month or so. In the meantime it is useless to offer any speculations as to the nature of the process, or the permanency of the proofs. It is well, however, to observe that this new process is not the same as that which M. Wothly employed a year ago, and by which he produced some prints which unfortunately faded. Those now produced are said to withstand the action of sulphide of ammonium much better than silver prints. We await the publication of the particulars of the new process with much interest, and our readers shall have the earliest information we can procure respecting it.

On the Purity of Iodide of Potassium.

BY E. C. CLAYTON.

The high price and large consumption of this article, has made it one which the manufacturer has special temptations to adulterate. Of late years, very large quantities of foreign make has found its way into our markets, giving rise to keen competition, which, in the case of drugs, is often far from improving their quality. From these considerations, we might still expect to find much that is impure, but the results detailed below lead us to a different conclusion.

The impurities of iodide of potassium are bromide and chloride of potassium, and sulphate, iodate and carbonate of potash. Moisture in excess is also to be considered an impurity, for besides giving the sample a greater liability to deliquesce, it shows an article of imperfect manufacture. The first-mentioned adulterant, though it has at times been frequently used, has in none of the fifteen samples experimented upon been found, and the second only in quantities from 3.7 per cent. down to minute traces. Sulphate was never found in ponderable quantities, and iodate in only 3, all of which, however, were of foreign manufacture. Several

English samples were analysed, for the sake of comparison. In these three cases it never amounted to 1 per cent. Carbonate, though more generally present, never amounted to 1 per cent., generally much under this. From these results, it will be seen that the iodide of potassium now in the market is practically pure, the per centage in all the samples being over ninety-five.—*Pholo. Notes.*

Transparent Colors for Photography.

Repeated attention has been called of late to the use of colors used in dying textile fabrics in place of pigments for tinting photographs. Amongst others Dr. Jacobsen has recently called attention to the especial advantages possessed by the aniline colors applied to this purpose. Our esteemed confrére and contributor, Dr. Hermann Vogel, forwards us an example of the mode of tinting thus recommended, which is very effective. We recently received an interesting communication from Mr. A. Urquhart, of Grantown, Strathspey, accompanied by a parcel of photographic landscapes colored with much taste; the method employed being expeditious and simple, consisting simply in the use of the colors commonly used in dying. An extract from Mr. Urquhart's letter will best give his mode of proceeding :—

"As I have very little time, the photographs I send you were each colored in about twenty minutes, so I can give no fine results. I wish only to call your attention to the colors, as being suitable for this purpose. Dyes are what I think should be used, although I have but little knowledge of them. In coloring the prints I send you, I employed one penny bottle of Lood's blue fluid, a sixpenny bottle of Majenta dye, and some yellow wood boiled. These are the only colors I have at present, so I could not produce many effects. The albumen on the paper has an affinity for dye, and takes it in. The dye will pass through the paper if kept on long, and will not easily wash out. Hyposulphite of soda has no effect on the dye. Finished prints can be dyed to any tint all over, and any body of color put on.

"Process.—In coloring the prints sent you, I proceeded as follows :—The prints were finished in the usual way, but not mounted; put in a basin of water five or ten minutes, and then laid on a piece of glass, and the surface dried with a cloth or blotting-paper, and the dyes applied with a camel-hair pencil. When the tint desired is obtained, I wash, and dry, and then apply the next tint, and so on, washing between applying each tint.

"The dyes work in every respect like water-colors, but leave no mark on the albumen. Touching up can be done on the card, or the face of a figure could be finished with water color as practised at present.

"Fruit and flowers photographed and colored with good dyes, must be fine. Dye-colored photographs could be varnished with oil varnish, as the colors are not moved by water or size.

"Dye-colored stereoscopic views are very beautiful; the dye being so much finer than any paint.

"Untoned prints, if colored in this way, look as well as toned ones. Prints intended to be colored, should not be toned dark, the brown prints color most natural. White parts could be protected from this dye by a touch of gum and cream of tartar, or the dye could be removed altogether by a preparation of lime used in dye works, and fixed more securely by a solution of alum.

"All I have said may not be news to you, but I never saw or heard of any dye-painted photographs, and thinking it might benefit photographers I make this communication; if any good arises out of it, I shall be very much gratified. A. URQUHART."

The specimens forwarded are very pleasing indeed; the coloring is applied in a broad style which is very effective, and to persons with artistic taste will be very simple and easy.—*Photo. News.*

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Waxing Photographs.

IN referring to the enamelling of photographs, we have remarked that for large pictures the highly glazed surface conferred, was not in our estimation an advantage; but that, on the contrary, it tended materially to destroy certain art qualities, which are associated with texture or quality of surface in monochrome pictures. The transparency and detail in shadows which the print possesses whilst wet, and loses whilst dry, is not, however, less desirable in large pictures than in the very smallest; and although it is difficult to restore this entirely without giving a varnished surface, it is possible to do so in a very large degree, and this is effected by waxing. Our attention was redirected to this subject recently, by Mr. Thurston Thompson, the skilful photographer to South Kensington Museum, who stated that he had not passed a print out of his hands for many years without submitting it to this process, for the double purpose of giving depth, detail, and transparency to the shadows, and aiding in the preservation and permanency of the photograph.

His mode of proceeding is as follows :—An ounce of pure white wax is dissolved in an earthenware vessel, and an ounce of turpentine is then stirred in and mixed with it. This is the waxing preparation ready for use. A portion of this is rubbed with a clean rag on to the surface of an unmounted print, on either plain or albumenized paper. A brush with a flat surface, with the bristles tolerably closely set, one really manufactured for a clothes brush, is then applied, and the wax brushed briskly over the surface of the print, until it is evenly distributed, and has, in point of fact, disappeared, and a finishing rub is given to the surface with a clean rag.

No additional glaze is given by this operation, but a result is applied something like the effect of a varnish in giving transparency, and bringing out detail in the shadows : detail which was before hid, now "bears out," as a painter would say, in all its minute delicacy, and the general effect of the print is very materially improved. On plain paper a little extra care is required to avoid making the surface patchy or uneven; but the print is marvelously improved by the process. Both plain and albumenized prints are, moreover, better preserved from any deteriorating influence by the minute coating of wax given to the surface. Any little smear of paste which the surface of the print may acquire when mounting, is much more easily removed when the print has been waxed, as the print may then be sponged without any danger of injuring the surface.

It has been objected, that turpentine has always a tendency to turn yellow, and that the prints to which it has been applied in conjunction with the wax will necessarily discolor in course of time. Theoretically, this is, doubtless, true; but, practically, the quantity is so small that we doubt if it would leave any perceptible defect in this direction. In order to avoid any chance of this kind, however, there are several other solvents of wax which may be used, such as benzole, ether, chloroform, and the essential oils. We have in our own experiments generally used the oil of rosemary or of lavender, either of which answers perfectly.—*Photo. News.*

Action of Light on Santonine.—Photo-Santonic Acid.

BY M. SESTENI.

Santonine, it is well-known, is colored yellow by exposure to solar light, and this takes place in a vacuum, as well as in the air It does not take place, however, when the actinic rays are cut off by means of a solution of nitrate of uranium.

Crystals of santonine reduced to powder, and then exposed to light, not only change color, but evolve a resinous odor, and acquire a very bitter taste. Water added to this changed santonine acquires a yellow color, presents an acid reaction, and has a bitter taste. On distillation, the same water yields an acid liquid which reduces nitrate of silver and bichloride of mercury, and precipitates acetate of lead white. The author concluded that the volatile matter formed during the coloration of santonine by light was formic acid. On evaporation to dryness, the distillate gives a deep, red-colored resinous residue.

By treatment with water, the colored santonine almost entirely lost its odor. On treatment with alcohol, it now in great part dissolved, giving a yellowish solution, which, on evaporation, left a reddish-yellow residue, the greater part of which was soluble in ether. The ethereal solution left an uncrystallisable residue of an amber color, and with a very bitter taste.

In subsequent experiments, made by exposing santonine to light under water, from which all air had been carefully expelled, the author obtained exactly the same results, and hence concluded that by exposure to solar light santonine is changed into formic acid, and an uncrystallisable substance much more soluble in alcohol and ether than santonine itself, and also a red resinous substance. To the yellow uncrystallisable substance he has given provisionally the name *photo-santonic acid.*

The acid, on analysis, gave results which agree very nearly with the formula $C_{11}\ H_{14}\ O_3$. Its chemical qualities will be described in a future memoir.—*Chemical News.*

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The Supply and Preparation of Uranium.

The probable greatly increased demand for the metal uranium as the chief agent in the new printing process, has excited in some quarters expressed doubts as to the possibility of meeting the demand, and it has been stated that but a single ton of pitchblende, the source of uranium, was in the market. We have already expressed a conviction that as enterprise and research were stimulated a supply sufficient to meet the demands would be found. We have since been informed that the Association of Photography have already received a contract from one person to supply them with ten tons per annum.

As to the preparation of the metal, the following communication we have just received from Sir J. F. W. Herschel will be read with interest.

Sir,—The introduction of the Wothlytpe process into commercial photography, appearing to lead, not only to a great consumption of uranium for the process itself, but to an increased diligence of enquiry into the photographic habitudes of that metal, it may not be amiss to recall to the attention of experimenters, who may wish to prepare the metal for their own use, from specimens of its ores in their possession, an exceedingly simple, cheap, and ready mode of obtaining it in a state of extreme purity, so far as contamination by any other metal is concerned, described by me in the *Annales de Chimie,* for March, 1832.

It is as follows: Having formed an acid solution, containing uranium, iron, and the other metals associated with it, precipitate by ferro-cyanide of potassium (the *yellow* prussiate); wash the precipitate well with cold water, by subsidence and decantation not by filtration (to prevent aggregation of the precipitation). Redissolve by carbonate of potash, filtering off any undissolved oxides, and add caustic potash to the filtered liquid. The oxide of uranium separates, of a beautiful yellow color, and after washing is free from all metallic contamination, though it retains in combination a little potash. If phosphoric acid be present, as is often the case in uranium ores, it will be of course retained in the liquid.

J. F. W. Herschel.

—*Photo. News.*

On the Comparative Permanency of some Photographic Processes.

(Concluded from page 239.*)*

By Mr. Pouncy's method of transfer, the carbon, and the carbon only, is attached to the mounting board by a thin spirit paste, or varnish, which cannot be acted upon by water; and, therefore, all prints so mounted will, we believe, remain as permanent as ordinary engravings in printers' ink. Great permanency cannot be obtained on paper, simply because the fabric of all paper hitherto made must give way to the destroying influences of time. Some of Mr. Pouncy's prints we have subjected to sunlight for months,and others we have kept for weeks, soaking in water, without visible deterioration in any way; and we have only been able to destroy them by substances which at the same time destroy the paper on which they are mounted.

With respect to the permanency of uranium and silver prints we can scarcely compare with these composed of carbon. They can only be compared with each other; and in doing so we labor under a disadvantage, owing to the details of the uranium process having been withheld from the public. Silver prints from having to pass through a fixing bath of hyposulphite of soda—all trace of which it is almost impossible to get rid of—may be said to contain within themselves the elements of decay. But apart from this or any other cause—the sulphur and other deleterious gases, always in a greater or less degree present incidentally in the atmosphere, must eventually complete their destruction, by acting on the silver, long before the paper on which they are impressed has succumbed to similar influences. From these causes, which are inseparable from their preparation, silver prints cannot be pronounced permanent in the strictest sense of the word. Were it possible to form the whole image of gold instead of silver, as is now done to some extent by substitution in the alkaline gold toning processes, greater stability would be ensured; but even then, if the picture were freely exposed to the action of air, decay must at last become manifest.

In the uranium printing process, so far as we are yet enabled to judge, no unstable and injurious fixing agent, such as hyposulphite of soda, is required. There is some satisfaction, therefore, in being able to get rid of that vexatious but indispensable "Mephistophiles" in photographic printing, as at present practised; and thus, we may make up our minds easy as to any baneful influence proceeding from that quarter. Thus far, then, a uranium print, in respect of stability, possesses a great advantage over a silver one, in *probably* having no internal substances slowly at works which will ultimately complete its destruction. But, on the other hand, uranium is a metal which, although not readily oxydised, as we have already stated, has such an extremely powerful—we might say violent—affinity for sulphur, &c., that any prints from it must be peculiarly liable to combinations with substances which are known to exist in the atmosphere. This is a mere theoretical opinion, given without any experimental knowledge of what forms the so-called photographic nranium image, and, therefore, must be taken only for what it is worth, By and by, when the details are placed before us, we shall be able to speak more definitely as to its alleged permanency.—*Brit. Journ.*

Collodion in Printing.—Cheap Solvents for Pyroxyline.

The use of collodion to contain the sensitive salts to be used in producing prints on paper, is a distinctively new idea, and one which may possibly be profitably employed in other printing processes besides that recently perfected by Herr Wothly. A brief glance at some of the advantages and disadvantages attending its use may therefore be interesting to our readers.

The application of collodion itself to paper is, of course, no novelty; the exquisitely delicate surface its film possesses, and many other qualities, very early attracted attention, and numerous experiments have been made to render it available, in combination with paper, both for the purpose of producing negatives and prints; it has been applied in various ways and various purposes; but the mode of using it has always involved the floating on, or immersion in, a nitrate bath, from which the sensitive salt was obtained by double decomposition.

The special advantage we see in the new method of using collodion arises, in the first place, from the fact that all the salts sensitive to light are combined in one vehicle, which, being spread on paper, produces at once a surface ready for exposure under a negative. In the usual printing processes, a sheet of paper containing an uncertain quantity of chloride and of an organic substance capable of combining with silver, is floated on a solution of nitrate of silver, which, after the first sheet is floated, contains an uncertain quantity of the silver salt, plus an uncertain quantity of other matter. Every sheet which is floated changes the condition of the solution, and it is only by observation and the exercise of judgment, that uniformly good results can be obtained. Skilful and careful printers do produce good, and, we believe, tolerably permanent pictures, but the process is in nature an imperfect and unsatisfactory one. When the sensitive salts are all combined in one inert vehicle, no such protean conditions exist; every specific portion of the vehicle used contains a definite proportion of the salts, and the stock from which it is used is not impoverished or changed in any respect. There is no interchange of parts going forward at each step of the process. The last sheet coated from a bottle of the preparation contains on its surface the sensitive salts mixed in the same proportions as the first. There is nothing, therefore, to prevent absolute uniformity of result. A valuable principle, it appears to us, is here embodied, which may be of value in other modes of printing.

A question which very naturally arises at once is : Can this principle be rendered available in silver printing ? It must be quite clear to the most sanguine admirers of the new process, that for many purposes silver printing will continue to be used for some time at least, and this question may therefore be worth some consideration. We think that it is very probable that collodion may, in some cases, be used for silver printing with great advantage. Chloride of silver is not soluble in alcohol or ether, nevertheless, it may be held in suspension in collodion. We have recently tried some experiments in this direction, which furnish suggestive results. In an ounce of collodion we dissolved about six grains of nitrate of silver, and having dissolved two grains of chloride of sodium in a few drops of distilled water, we added this carefully, a drop at a time, shaking the bottle between each addition. The result was something like an emulsion of chloride of silver in collodion. The particles of chloride appear to be so infinitessimally small, that they remained in a state of suspension, giving a homogeneous, opalescent preparation, which showed no tendency to precipitation at the end of a fortnight. Paper coated with this, and exposed to light, darkened, giving an even purple tint.

It was not very sensitive, nor did it bronze by long exposure; but this was, we apprehend, due rather to the small quantity of the salts used, and some inexactitude in their due proportions, rather than to the vehicle in which they were formed. This difficulty is one which might therefore be easily remedied by the use of a larger quantity of the salts, and observing especial care in adding the proportions so as to secure the presence of a certain amount of free nitrate.

The sample of collodion we used contained an excess of ether, whilst for the purpose in question a sample containing very little ether would be desirable. Ordinary rectified spirit will, we believe, dissolve about fifteen grains of nitrate of silver to the ounce; and a collodion containing this proportion, it is probable would give much better results. The chloride employed might be one soluble in alcohol, which would render it unnecessary, to employ the additional few drops of water necessary to dissolve chloride of sodium or of ammonium.

To dissolve nitrate of silver in collodion requires a little care. The best plan is as follows :—Place the silver to be dissolved in a clean mortar with a few drops of water, and pound it into a paste, then add a little rectified spirit, and rub the whole together in the mortar, adding spirit until the whole is dissolved. The aim is here to make as strong a solution as possible, and no certain amount can at present be given, as a number of experiments would be necessary to determine the proportion of nitrate of silver which spirits of different strengths may be made to dissolve. But by eighing the nitrate first, and then measuring the solution as it is added to the collodion, it will be easy to ascertain the quantity added.

We do not propose this as a substitute for the present process of printing on albumenized paper, but it may furnish to the amateur a ready mode of proving a negative without all the trouble of cleaning or dusting dishes, filtering solutions, &c., necessary in his ordinary preparations for printing. A bottle of this preparation might be kept ready for use, and a sheet of paper coated and made ready for the pressure-frame at a minute's notice.

But there is another purpose for which collodion in printing probably may be made useful to the professional printer; we refer to its employment in solar camera and development printing. Hitherto, plain paper has been chiefly used for development printing. Albumenized paper has not generally been found suitable for the purpose. Various plans have been suggested and tried with varying degrees of success for keeping the image on the surface, and so preserving vigor and avoiding the dull heavy effect of an image which is all in the texture of the paper instead of on the surface. It appears to us that the use of collodion will in all probability remove all difficulties. A collodion prepared as we have described with any mixture which might be found desirable of either iodides, bromides, or chlorides. Paper coated with this preparation would preserve the image on the surface, and would materially facilitate the manpiulations generally. It would after exposure, be, of course, dealt with in the usual manner in development, fixing and washing.

To the taste of many the texture of surface given by collodion will be a great recommendation. By a little variation in the preparation and manipulation, almost any kind of surface may be secured, from that resembling plain paper—a little finer, but not more glossy—to that of the most highly albumenized or enamelled paper. So much for the advantages.

What then are the disadvantages? These, it may be alleged, are threefold: first, the difficulty of coating large surfaces evenly; second, the rapid evaporation, which not only increases that difficulty, but makes the operation an unpleasant and dangerous one, from the fumes of ether; and third, the great cost of collodion.

The first difficulty is one of manipulation, which may be very easily overcome with practice. The second and the third appear more formidable, but we believe by no means insurmountable, and the remedy we intend to suggest deals largely with both objections at once.

Collodion is generally described as a solution of pyroxyline in ether and alcohol; but it is by no means necessarily that. There are other solvents of pyroxyline, besides ether, or ether and alcohol : possibly many; but we know one which is very much to the purpose. Pyroxylic spirit, or common wood naptha, is an excellent solvent for pyroxyline, better in fact than ether. This fact was first published, we believe, by Mr. Spiller, nearly ten years ago; and but for the apprehension felt in some quarters of the danger to the nitrate baths from methyllic compounds, might possibly have been utilized before now. The common samples of wood naptha, are, it is true, sufficiently uninviting in odor to render their use by no means desirable, if they could be dispensed with. We have recently been making some experiments, and find that in a highly rectified sample of naptha, this unpleasant smell is comparatively absent. But here another difficulty arose. A highly rectified sample of wood naptha costs twice as much per gallon as methylated alcohol, and though it would still prove a cheap solvent, it would not render the collodion as cheap as it is desirable it should be for printing purposes. It then occurred to us to use the naptha, not as the sole solvent, but in conjunction with alcohol, making the naptha, in fact, take the place of the ether. This we found to answer perfectly, giving readily a clear satisfactory solution.

There is another noteworthy fact in connection with this experiment. We were a little surprised to find that the collodion made from naptha alone gave a film which dried white or opaque or opalescent, powdery, and wanting in coherence, instead of being clear, glassy, and tenacious. We then tried in succession two or three other samples of pyroxyline, all of which yielded similar results. We still, however, felt disposed to attribute this defect to the cotton rather than the solvent; on referring, however, to Mr. Spiller's experiment, we find that he notes a similar tendency, partially removed by the use of a specially prepared sample of anhydrous naptha, but still remaining to some degree. On making a sample of collodion, however, from naptha and alcohol, we found this tendency disappear, and the film was, in all respects, satisfactory. We noticed another singular fact in connection with these experiments: in one case we added pyroxyline at the rate of about twenty grains to the ounce to collodion: this was dissolved by naptha perfectly, but gave the powdery white film. On adding alcohol sufficient to reduce it to five or six grains to the ounce, it became slightly turbid, and finally gave a considerable amount o deposit; but the film was clear and tenacious.

We think, then, that by the method we propose, a collodion may be produced which will answer every purpose. It will be very cheap, especially if some of the less expensive modes of making pyroxyline be found to answer in conjunction with it. The price need only be a fraction of the price of pure negative collodion. It will not rapidly evaporate either to hurt the manipulator, or alter the thickness of the collodion. Where ether is employed in conjunction with alcohol, the ether being the more volatile, rapidly evaporates. Naptha and alcohol, are, however, very much alike in their respective degrees of volatility, and evaporation, besides being slow, will proceed in about equal ratio with each material.

There are other purposes for which a cheap form of collodion may probably be found valuable, as, for instance, in carbon printing, enamelling prints, &c.. For any of these or similar purposes, we commend the preparation we have described.—*Photo. News.*

The Infallible Remedy.

I PROPOSE to write a short chapter on a neglected subject;—neglected, I should say, so far as the AMERICAN JOURNAL OF PHOTOGRAPHY is concerned, and so far also as its discussion in the photographic societies is concerned.

It relates, however, to an agent very much in use in photography, and used by some with great success, financially speaking. In fact, by its use, a person ignorant and unskilled in the art, is transformed in an inconceivably short time into a *first class artist.*

Now, I propose to reveal this secret to all the attentive and intelligent readers of this Journal who do not understand its use value and importance. Tyrosand Neophytes, attend!

The article in question is the discovery of a *genius.* Well, we all know what a genius is. A genius is a fellow who doesn't require any learning: who knows everything and can do anything by instinct. Say, for instance, he is a sign painter; now being a genius his aspirations draw him powerfully towards something higher, nobler and more respectable, or perhaps more profitable. Very well: being a genius, he may turn photographer at once, by using this "*infallible remedy*" which I am about to make known to those who do not already know it.

Let me say just here, for the benefit of those who have made photography a study, and by years of patient toil have become skilled in the art, the great revelation about to be made will be of no earthly use to you; the "remedy" is not for you;—"the whole have no need of a physician." But *skill* and *experience* that are acquired only by long study and patient practice, are old-fashioned nonsense—of no account whatever to a genius. There is something much cheaper, more abundant, and a thousand times more easily obtained, that will run a gallery just as well or even better, with which the intelligent reader is soon to be made acquainted.

Again, I will candidly say to those who may be perusing this valuable contribution in the hope of gaining some information concerning the cause of "pinholes," "streaks," "blotches," weak negatives and weaker prints, that the "infallible remedy" will not meet your case. It is applicable to a different class of symptoms altogether. It is for one who may wish to *run a gallery* withou; the inconvenience or expense of acquiring a knowledge of the art who after taking four lessons in flowing, dipping, focussing and developing, and four more in floating, fuming, printing and toning, is ready and *willing* to launch out before the loving public. The remedy in question is just the thing for him. I will now proceed to give the ingredients. It is composed as follows:—

Nitrogen........................	79 fluid ounces.
Oxygen..........................	21 " "

To which add carbonic acid, *quantum placet.* The quantity should be small. In most cases there is also added a slight mixture of dust, and under some circumstances *fog;*—proportions variable. The compound in good working order is vulgularly called—Wind! The "Infallible Remedy" the "Elixir of Life" for all those who have little else to recommend them. *Blowing* will transform the most indifferent picture shop into a first class Imperial Photograph Gallery. Pope says—

> "As in bodies so in souls we find,
> What lacks in blood and spirit 's filled with wind."

Which means, if a man don't know much, he will be likely to blow a good deal; in other works, what is wanted in skill will most likely be made up in *blowing*. And *vice versa* when there is much blowing there is not generally much of anything else.

As a further illustration of the practical working of the gaseous substance under consideration, I will mention those valuable contributions to the current photographic literature of the day, which are heralded by powerful and effective blowing. Some wonderful discovery or discoveries have been made out west, or down east, in some city hitherto somewhat obscure, of which discovery or discoueries the entire photographic brotherhood have the opportunity of availing themselves for the trifling sum of *five dollars* each, and thereby escaping all the ills that photographers are heir to. That you may be sure this time that the *wind* blows in the right direction you have testimonials of one lawyer, one judge, one blacksmith, one shoemaker, and one hotel keeper, all of the city aforesaid and of whose veracity you are supposed to have no doubt, that the genius whose discoveries you may now possess, is a young man of good moral character!

Of course you remit, and receive in return two pages 12mo. very coarse paper, printed with badly worn type, wherein after reading about a dozen familiar formulas so badly misspelled and shabbily worded that you hardly recognise old acquaintances, you are informed that by sending *one dollar* to the subscriber you will be furnished an excellent recipe for making *soft soap!*

PHOS.

A Dogtype, and How It was Made.

MR. EDITOR, I am a dog—not a cur, but a skye-terrier—and of late had the curiosity to enter the photographic galleries, to see if I couldn't get my picture. I have run in and out from one to another, and finally have succeeded. I will tell you how I did it. Passing through the Bowery the other day, I saw a large display of cartes de visite, and turning about and wagging my tail, I ran up stairs, and finding the door open, went into the operating room; and after smelling around the four corners of the room, squatted myself in the chair, to the surprise of the operator who was busying himself, preparing for the next customer. But there I was, eyeing the camera and winking—as much as to say, why don't you take me? The operator took the hint, and I was taken.

I want to know how these fellows do such things, as all he did was to look through the camera, his head covered with a black cloth then went into a closet, and did something with the glass. Now I would like to know if there is anybody in the box that paints the picture on the glass, or if the spirits have anything to do with it, as I heard him ask the boy if there was any more spirits in there, pointing to a demijohn.

I am highly delighted since I have my picture, and expect all the dogs, poodles, etc., to follow my example and encourage those operators who are at present afflicted with the blues.

Yours, doggedly, Bow-wow.

Mr. C. C. Harrison.

The art of Photography has lost a devotee; one who has done more for it than any other man in America. Mr. Charles C. Harrison has been removed from our midst by death. A man beloved by all who knew him, a kind husband, an affectionate brother, and a faithful friend.

As a practical optician who has accomplished great results by indomitable perseverance, his name in photographic science will ever be cherished by all who delight in the practice of that fascinating art.

As one to step forward as a friend, I will relate an instance of my own experience. In the Fall of 1851, I constructed a camera box for the purpose of taking paper negatives by the Talbotype process, and wishing to obtain a combination lens, I applied to Mr. Harrison to furnish me with a suitable tube for it; he told me to bring my box to his place of business, and to call again in a day or two. At the appointed time Mr. Harrison told me he had not been able to find anything that would suit the focal length of my box, but that he had a good camera and tube (not of his own manufacture) that he would loan me, for any length of time I might require it; merely taking my personal appearance as a guarantee for the safe return of the instrument. I never was introduced to him, and therefore was an entire stranger, and the reason he gave me for his generous offer, was that anyone who wished to experiment in photographic pursuits, he would assist as far as he possibly could; and that any knowledge that he could bestow would never be withheld. How many men can there be found at the present time, with such traits of character; no doubt they are very few. No man loved the art of photography more and no one could ever be more assiduous in experimenting night and day for improvements, that he was spared long enough to see accomplished. G. W. E.

North-western Photographic Society.

The above named Society held their first meeting for the coming winter session, at their new room, Oct. 28th, King's Block, cor Washington and Dearborn Sts., Chicago, Ills.

The meeting was called to order by President E. L. Brand in the chair; the minutes of the last special meeting held at the Tremont House, to appoint a committee on procuring a room, &c., were read and approved.

The names of Joseph Hingey, and C. W. Florence, were proposed for membership, and unanimously elected.

Report of Board of Directors.—The directors were pleased to lay before the society the following photographic journals, which had subscribed for for the benefit of the members, viz., *The Philadelphia Photographer*, Seely's American Journal of Photography, *Humphreys Journal*, *The British Journal of Photography*, and *Photographic News*.

The committee on design for membership asked for further time, which was granted.

Motion made and carried that the Secretary correspond with the proper revenue officer, in regard to stamping of photographs.

After a brief and interesting conversation on what should be the subject for discussion at our next meeting, it was resolved that the members come prepared to exhibit specimens of negative work, with the plan of making the same, and the varnish used.

Motion made and carried that the Society resolve itself into a Committe of the Whole, for the decoration of the room, and immediate action invited.

Motion made and carried that a vote of thanks be tendered the committee, for their efficiency and promptness in procuring and furnishing the room.

The Society then adjourned to meet on Friday evening Nov. 4th.

The North-western Photographic Society met at their room, on Friday evening, Nov. 4th, with a full attendance of members.

The meeting was opened by President E. L. Brand in the chair.

The minutes of the previous meeting were read and approved.

Election of Members.—Mr. Oscar J. Bill was proposed and elected unanimously. The following gentlemen were proposed as honorary members, and elected unanimously, Mr. Bogardus, Mr. Anson, C. D. Fredricks, Mr. Brady, Mr. Gurney, Prof. Towler, Nicholas Pike, August Moran, W. Winter, of Cairo, Dr. Mahla, T. B. Bryan, and L. H. Volk, of Chicago.

Discussion on Science and Art.—Mr. Carbutt entertained the society with some very appropriate hints on the method of treating negative baths, sensitizing collodion and the manner of redeveloping negatives with pyrogallic acid and silver; and answered numerous questions on the various modes employed in intensifying negatives.

Mr. Green exhibited negatives strengthened with sulphuret of potassa, and prints from the same.

Mr. Worth also exhibited negatives and prints, both showing a good degree of skill and care.

Mr. Shaw gave his formula for intensifying negatives, composed as follows : into a half gallon of water, put 4 ozs. bichloride of mercury, and 2 drms. muriatic acid; when the water is saturated with the mercury, add 2 drms. of iodide potass. in solution and tincture of iodine till of a wine color; two parts of this to be diluted with twelve parts of water, and flowed over the negative after fixing and washing.

A general discussion followed, and it was resolved that the subject of making negatives be continued at our next meeting.

The Society then adjourned till Friday evening, Nov. 18th, the regular monthly meeting.

Editorial Department.

———We have a piece of bad news for the friends of this Journal. Concerning the financial troubles incident upon the rebellion, we have been as hopeful and independent as anybody. We fancied we were only weathering a storm which would soon blow over. While our neighbors of the periodical press, either gave up the ghost, or refused to live except on an increase of ration. This Journal although the cheapest periodical of the kind in the world, we said should go on without any change in the programme. While all other necessities of the intelligent photographer had doubled in cost, we took pleasure and pride in promising that this Journal should greet him as of old. Had this publication been with us simply a temporary and pecuniary interest, we would have felt and acted very differently. But the fact is that we look upon it as a permanent institution which shall pass out of our own control only by authority of the last will and testament.

But at last we yield to the pressure, (where is the publisher who has stood it so long ?) we are afflicted with the high price of paper and labor, and we need relief ; something must be done. After an earnest examination of the whole case, we have concluded—not to die, not to live as some of our neighbors do, by retrenching the corporeal dimensions—but to raise the price of subscription. This is our conclusion :

On and after the 10*th of December, the subscription price of this Journal will be* THREE DOLLARS *per annum*.

We take pleasure in assuring our faithful friends that the new arrangement will affect them but little. The old rates continue for those who have already paid or or will pay befor the 10th inst. And we suggest to those whose subscriptions expire with No. 12, that they may secure the second half of the volume for one dollar, provided that sum be mailed to us before the 10th. Thus we try to make it easy for our tried friends, and to compel the unenterprising outsiders who will be constantly dropping in to assist us in paying for paper.

We close with the pleasant consideration that the Journal never had so many ubscribers, and never a better prospect for more.

———Mr. C. C. Harrison the well-known optician, after a short illness, died on the 23rd ult. We have been promised a sketch of his life, which has failed to reach us in time for the present issue.

——— The proceedings of the last meeting of the Photographical Society have not been received up to the time of going to press.

Minor Correspondence.

J. H. D., of Ind.—"I wish you would give me all the information you can relative to the new artificial light which is so much spoken of in photographic journals for printing with the solar camera. Is it so very cheap and superior as recommended, and can it be procured in this country, and of whom? I am making large solar work, and coloring and ivorytyping is my business, and cloudy weather such as we have had for nearly the last two months is a very serious drawback. Will the artificial (magnesium) light help us out? What would be the expense per day of the Drummond light? I want Light. In my opinion there is no question about the superiority of the solar over any other method of making large prints if good summer sun or its equivalent could be had."....The magnesium light at present is out of the question—it costs too much except for experimental purposes. We think it practicable, however, to use the Drummond light for copying and enlargements, at least on collodion. The expense of one light should not exceed $5 for twelve hours. It is a common thing to print transparencies with gas or lamp light.

J. H. B., of O.—"What do you use to keep your silver bath clear or remove the color when using albumen paper? The china clay roils it. What will clear the gold bath that fumed paper has been toned in." ....Kaolin is commonly used for clearing the printing bath. The clay will settle if you give it time enough or it may be filtered out. Animal charcoal or chloride of silver may be used instead of kaolin. ..Fumed paper should be free from fumes of ammonia before toning, and then we suppose the bath will not be colored. ..We know of no plan for removing the color from the toning bath.

F. B. M., of O.—"You will confer a favor by sending me a formula for a sixty-grain bath. one that will make negatives and ambrotypes, as I wish to try a bath of that strength. ....Water, 1 oz.; nitrate of silver, 30 grs.; iodide of potassium, 5 grs. Dissolve and filter for use.

M. M. L., of Tenn.—"Please inform me if there are instruments in market that work quick enough to take photographic views correctly of moving bodies, such as soldiers marching, passing teams, &c. If so, what would be the price of a 4-4 tube, and where procured to the best advantage?" ..For instantaneous views the ordinary portrait lenses are used. We are not aware that any instruments have ever been specially made for instantaneous work.

C. M., of N. H.—"Color blind again, I was: two numbers of the Journal have not come along, and that is enough to restore one's sight, or go blind for ever, photographically," etc. ....The letter contained two dollars, and some superb photographs. The latter may go into that album

Carthage, of N. Y.—"I wish a formula for printing and toning with bichromate of potassa. What is the paper used, plain or albumenised? How strong does the solution of potassa require to be? Are the prints permanent? Can you get a carbon print for me, and what will be the expense?" ....Use a nearly saturated cold solution of the bichromate on any kind of paper, and you will get a picture. The print will be weak but permanent. ..We do not know where to get a carbon print. Why not make one yourself? The process is easy enough.

P. A. M., of N. Y.—"Is there any process by which a varnished negative can be intensified again?" ....Soak the negative in alcohol till most of the varnish is dissolved, then treat with solution of bichloride of mercury in *alcohol*.

C. W. of Ill.—"What is the name of that hydro-carbon which is pumped out of the street gas pipes? By what process could it be purified from its bad smell?" ....The oil is here commonly but improperly called gas tar. It may be purified by the process used for petroleum.

THE AMERICAN
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[NEW SERIES.]
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The Wothlytype Patent.

Specification.

An appeal was made in our columns last week to the patentees of the new printing process for details of the process, which in the ordinary course of law would not be made public until next March or April. We have brought that appeal specifically before the directors of the Association, and have received authority to publish extracts from the specification giving all the points of fnformation of any importance.

It is entitled "A new Chemical Process for producing Photographic Pictures and in the preparation and manner of using the Materials in such Process." It will be seen, that putting other details aside, the really salient claim upon which the patent is grounded, is the combination of nitrate of uranium, nitrate of silver, and collodion, thus uniting in one vehicle all the sensitive salts necessary for producing a definite image under the action of the light. Each of the agents have before been used separately, and combinations of some portions of them before, but not the three combined, and it appears to be this combination which constitutes the practical novelty of the patent. We have in another article, written before we had seen this specification, expressed a conviction that where silver was used at all in printing, some other solvent beyond water, would be necessary to ensure the removal of all traces of that metal from the print. It will be seen that no mention is made in the specification of any preparation for the purpose of removing the salts not acted upon by light beyond acetic acid; and from what we can glean, it appears to be the conviction of Herr Wothly that no other fixing process is necessary. As a precautionary measure, we believe, however, that Col. Stuart Wortley, has used a solution of sulphocyanide of ammonium, and that the prints upon which our testing experiments, described a few weeks ago, were made, had been so treated. Whether prints simply washed would bear similar tests remains yet to be proved. The following are the extracts from the complete specification :—

The features of novelty in this invention consist—

First, in a new method of preparing photographic paper, by bringing the fibrous material of which paper is composed into actual contact with the compounds or simple agents used as mediums for coating such papers, thereby producing a better, smoother, and more even surface.

Secondly, in producing on a photographic paper a "matt" or "dead" surface, instead of a smooth or unglazed surface, so that when pictures are printed on such paper, they will have a mellow and quiet effect.

Thirdly, in a new chemical compound for rendering photographic paper, or other material, highly sensitive and in being able to print photographic pictures on paper orother material, to the actual intensity (in color) required, doingaway with the necessity of over printing, and allowing for reduction of intensity of color in the bath, as is now the case.

The following are examples of the means by which these improvements in photography may be effected.

Chapter 1st. As regards the preparation of photographic paper, or the surfaces of any other material capable of receiving an impression by the action of light.

We take well-made paper, such as is expressly made for photographic use, and cover the surface of such paper, with one of the well-known and simple mediums, such as arrowroot, or common starch, albumen, &c., &c.: or with such simple mediums as described in combination with any other simple material, suitable for any special purpose, and instead of merely enveloping the surface with the solution, and then allowing it to be naturally absorbed, which will "furr" up the surface of the paper, and merely deposit itself between the fibre (as is now the case), and when dry, prevent the fibre of the paper from laying down, and being properly interlocked together, in fact, assuming its original surface. We, instead of the old process as above, first envelop the surface or other materials, with the solutions, as before described, and either place it under pressure, between two polished surfaces or subject the paper to a rubbing process by any material best suited to force the medium into, and between the fibre, and lay them in a firm and compact manner to produce, when dry, a smooth surface; or we pass the paper between rollers especially constructed to effect the purposes herein specified; the great and important object being to incorporate the fibre again, after being fully charged, so that when dry and prepared, it will have a better surface for the production of photographic pictures.

Chapter 2. Our next novelty in photographic chemistry and manipulation, is in rendering the surface of such paper or other materials highly sensitive to the action of light, for the production of pictures from, and through the negative to the positive. Instead of using the ordinary preparations of nitrate of silver, we prefer to use preparations of another metal in combination. We take collodion prepared by any of the well-known methods, to which may be added any of the gums or other mediums to produce elasticity, flexibility, and adhesiveness, preventing the edges from being defective, dependent upon the state and humid condition of the climate. To render this collodion sensitive, we add, say to one pound of collodion so prepared, from 1½ ounce to 3 ounces (or even more) of the nitrate of uranium, to which we add from 20 grains to 2 drachms of the nitrate of silver.

When the solution is thus rendered sensitive, we prepare the paper or other material (in a properly lighted room) by pouring the sensitive collodion on to the surface, and then float it in the ordinary way, the superfluous quantity being poured off the paper It is then hung up in a dark room to dry, when it is ready for the printing frame.

The above sensitive collodion thus prepared and combined has the following advantages over the old process, viz., that instead of having to print the positive to a greater intensity of color, to allow for its reduction in the bath, as is now the case, we print the picture from the negative on to the positive paper (or other material previously described) up to its proper strength of color, such as in appearance will be satisfactory to the operator, and then immerse in a bath of acetic acid or any other agent, in solution, to dissolve the salts, which are unaltered by the action of light (which takes by this process from ten to twelve minutes). We then place the picture on a sheet of glass, under a stream of water, and rub it with a brush or sponge, or we pass it through a series of baths until it is perfectly clean. We then pass the picture in any of the so-called toning baths containing chlorides of the superior metals. Or the hyposulphite bath may be used or not, as may be required by the operator to produce any tone of color he may think best suiting his taste.

Chapter 3. If we require a photographic picture, the effect of which will be what is technically termed a "matt" or "dead," and not glazed appearance. Instead of dissolving the sensitive salts in collodion, as hereinbefore described, we dissolve them in alcohol and water, and add any, if necessary, of the saccharine substances. We then prepare the paper by covering it with the alcoholic and water solutions, combined with the chemical salt to render the paper sensitive.

The paper thus prepared is hung up in a dark room to dry, when it is ready for printing by the action of light.

Having now fully described and set forth the nature and object of this invention, together with the best means we are acquainted with for carrying the same into practical effect, we would remark that we do not confine ourselves to the precise quantities herein specified, as they are required to be varied in accordance with the class of negative to be printed from, or in the manner of manipulating, as long as the principles of the invention are adhered to. What we claim is,

Firstfy : The manner of preparing paper or other material as herein set forth in chapter one.

Secondly : The using of nitrates of uranium and silver in combination, by which a new salt is produced, and using them so combined with the mediums herein specified, for the production of photographic pictures and their development, at one operation, as set forth in chapters two and three of the specification.—*Photo. News.*

Dry Collodion.

BY DR. SCHNAUSS.

Preparation of the Collodion.—Every kind of *good* pyroxyline may be employed in this process.

Fill a large bottle two-thirds full of carded pyroxyline, then pour to it a little alcohol, sp. gr. 0·835, and shake it. The pyroxyline loses much of its bulk; we then add sufficient ether to fill the bottle two-thirds, and then sufficient alcohol to fill it completely. Shake the bottle well, and leave to settle for several weeks. The clear supernatant liquid is then diluted, by mixing one part, by measure, of this collodion, with one part of ether, and one part of absolute alcohol. In summer, take a little less ether, and a little more alcohol. After shaking vigorously, prove the density of the mixture, by pouring a little upon a clear glass plate. The film must not be too thin, but the liquid must flow without streaks. If it is not thick enough, add a sufficient quantity of pyroxyline.

2. *Iodizing Solution.*—This is prepared as follows :—

Dissolve in alcohol, sp. gr. 0·835......	40 parts,
Iodide of ammonium..................	4 "
Iodide of cadmium.................	2 "
Bromide of cadmium.....	1 part.

This solution must be prepared eight days before it is required for use. Filter through paper moistened with alcohol, and add as much of it to the collodion as will give a white film when put into the sensitizing bath. The iodized collodion must be left two or three days to settle; it then becomes very clear, and of a light yellow color.

3. *Nitrate of Silver.*—This bath is composed of—

Nitrate of silver.......	1 ounce,
Distilled water........................	12 ounces,

to which 10 or 15 drops of the iodizing solution is added. Shake the mixture, and leave it for some hours exposed to the sun's rays Then take a negative with the collodion, the sensitizing bath, and the pyrogallic acid, or commercial sulphate of iron developer, to make sure of their efficacy. If the picture develops vigorously without fogging, the solutions are in good condition; if it does not, then add a few drops of acetic acid to the sensitizing bath.

4. *The Alkaline Developer.*—We require the following solutions: *a, Dilute Alcohol*—6 ounces of alcohol mixed with 10 ounces of distilled water. *b. Ammoniacal solution*—dissolve 1 drachm of pyrogallic acid in 15 drachms of absolute alcohol. *c. Pyrogallic acid solution*—Dissolve 1 drachm of pyrogallic acid in 15 drachms of absolute alcohol. This solution will keep a long time; it becomes red, but deposits no precipitate. The aqueous solution, on the contrary, will keep only one or two days. It is prepared by—*d*—mixing 1 drachm of diluted alcohol *(a)* with 25 drops of the pyrogallic acid solution *(c)*.

5. *Intensifiing Solutions.*—These solutions may consist of the ordinary mixture of pyrogallic acid and silver solution; but where the modification of the light, and the change in the duration of the exposure, are so little under control, it is preferable to have ready also a freshly prepared solution of citric acid, to be added to the pyrogallic intensifier, in case the negative should come out too quickly and energetically. Citric acid, too, may be added to the silver solution, and the precipitate dissolved by a drop or two of dilute nitric acid. By this means the operation of intensifying is brought more within control, the shadows become clearer, and the light stronger.

Other methods of Development.—The alkaline developer is especially adapted for winter use; but in summer the same advantage can be obtained more easily as follows:—

Pyrogallic acid	10 grains.
Distilled water	10 ounces.
Formic acid	2 drachms.
Alcohol	½ minim.

The plate is previously flowed with the "dilute alcoholic solution" *(a)*, then again washed until the surface appears *uniformly* moist, it is flowed with the pyrogallic acid, which, after awhile, is poured back into the developing glass, containing a few drops of citro-nitrate of silver; the mixture being well shaken, is again poured over the plate.

The double sulphate of iron and ammonia with acetic acid, may sometimes be used with advantage in the development of dry plates, and especially so, if a smaller quantity of citric acid and alcohol be used instead of the acetic acid. Iron developers must not be poured upon the plates before the silver solution, as is the custom with the pyrogallic acid developers. After the plate has been moistened, either with water or dilute alcohol, in which latter case the alcoholic solution is well washed off, it is immersed for a few seconds in a bath slightly acid, then well drained, and the iron solution poured.

6. *Preservative.*—One ounce of large raisins are boiled in large ten ounces of distilled water, the solution is then put aside to cool, and then filtered. A few drops of acetic acid will make it keep better.

7. *Gelatine Film on the Prepared Plates.*—The use of gelatine wastes much time, and is altogether unnecessary; it is intended to prevent the collodion film from slipping off the plate in the subsequent operations, a result which often easily happens with all the dry processes. This, however, may be overcome by roughening the edges of the plate on a grindstone, or by varnishing the edges of the dry collodion film after exposure; it may also be diminished by carefully cleaning the plates, by a good condition of the collodion, and by covering the surface before development with dilute alcohol. If gelatine be used, it is prepared by first soaking four grains of gelatine in two ounces of water, and then dissolving by heat. When cold, about a drachm of alcohol is added, and the solution is filtered. The gelatine sometimes does not easily flow over the plate, in which case the latter is held over a vessel containing hot water, and when warm, the gelatine is poured quickly over it, and spread uniformly by means of a glass rod. Sometimes, and this is especially the case when the edges are not thoroughly cleaned, the gelatine is repelled from these parrs, and the plates have to be cleared over again.

Manipulations.—The coating of the plates with collodion, and the sensitizing operation, are the same as in the wet process. The plates are afterwards placed collodion side upwards in a large clean vessel of distilled water, and frequently moved. At the end of five minutes each one is taken out, well drained, and then flowed three times in succession with fresh portions of the raisin solution, which must be kept carefully in motion so as to cover the whole of the plate equally. After which, the plate is allowed to drain thoroughly, and then put away to dry in a dark place, completely dry, and free from dust. Drying by artificial heat is not recommended.

The principal cause of the want of success in dry plate photography is to be attributed, in my opinion, to the numerous manipulations they have to go through, as, for instance, the number of times they have to be washed, and secondly, to the length of time between the exposure and the development. These give rise to numerous invisible sources of defects. A trace of any reducing agent in the dish, in the water itself, or in the air of the developing room, is quite sufficient to produce all manner of fogging and stains. It is necessary, on this account, that acids should predominate in all dry processes, and on this account the sensitiveness is diminished. Since common water mostly has an alkaline reaction, and it is not convenient to use freshly distilled water for washing—by far the safest, although the most expensive method—the water must be acidulated with acetic acid. For, however usefully alkalinity may act in the first stages of the development of the dry plates, the more injuriously it acts beforehand, and especially if the plates are kept long. When common water is used for washing the plates, care must be taken to use distilled water for the first and last washings, and to add to the common water with a little acetic acid.

The length of exposure varies according to the intensity of light, as well as the nature of the development, the alkaline developer requiring the shortest exposure (20 seconds being about sufficient with a pair of landscape stereoscope lenses and a good light); the ordinary pyrogallic acid developer requires the longest exposure. Iron development in point of sensitiveness stands next to the alkaline developer, then the above mentioned developer with formic and pyrogallic acids.

Alkaline Development.—The negative is covered several times with ammoniacal alcohol (*b*), which is finally poured into a clean glass containing one-fourth of the volume of alcohol of the dilute pyrogallic acid; the mixture is then shaken, and again immediately poured upon the plate. In case the exposure has been right, and the plate has been well prepared, the picture will appear uniformly in a few seconds, although feeble. All the stains, too, which may appear, become at this stage visible. With a good picture, the lights and shades are even now visible. If the picture is foggy or has been over-exposed, the whole plate is covered with a reddish veil, in which case more citric acid is to be added to the following intensifier : if the plate has been under-exposed, nothing appears as yet. The fluid is now allowed to flow off, and the plate is *carefully washed.* A small quantity of the ordinary pyrogallic acid solution is mixed with a little citro-nitrate of silver, and then poured upon the plate. The picture now appears rapidly, and with great intensity, and has to be cautiously watched lest it become too intense. The plate is finally washed and fixed in the usual manner.

Major Russell, to whom is due the honor of the discovery of the tannin process, as well as the alkaline developer, lately complains of the sudden failure of his alkaline developer, without having discovered any satisfactory cause. Mr. Sutton gives another sort of alkaline developer, which is said never to produce either fogging or stains; and, since it may be applied to my process, I repeat it here :—

(*a*) 10 grains of bicarbonate of soda, in
1 ounce of water;
(*b*) 10 grains of pyrogallic acid, in
1 ounce of absolute alcohol.
(*c*) 1 ounce of water,
1 drachm of the solution (*a*).

After the plate has been moistened with water, it is cotaed with the solution *a;* this is poured, after awhile, into a vessel containing 20 drops of the pyrogallic acid solution; the mixture being well shaken, is again poured upon the plate. The remaining part of the operation is like that just given. The formic acid developer has produced for me in summer more constant results than the alkaline developer; on the contrary, during the last winter I obtained better pictures with the latter. The formic and pyrogallic acid, as far as it is possible, must be freshly prepared each time it is used.—*Le Moniteur de la Photo.*

Collodion in Printing with Chloride of Silver.

We described a few weeks ago the somewhat singular and hitherto unknown or unrecognised fact, that chloride of silver could be held in collodion, and thus rendered available for printing. That iodide and bromide of silver could be employed in collodion we had proved years ago, but that these were to some small extent soluble in alcoholic solutions of the alkaline iodides had been understood from the early days of collodion, when Dr. Diamond published in *Notes and Queries* a formula for collodion containing iodide of silver. But the idea of using collodion as a vehicle for holding in suspension chloride of silver had never been suggested. Chloride of silver, it is known, is soluble to slight extent in solutions of the alkaline chlorides, and as some are more or less soluble in alcohol, a small portion of chloride of silver might be dissolved, but as the excess of the alkaline chloride would render this quite insensitive, it was altogether useless for printing purposes. When, therefore, it occurred to us to make the experiment we recorded, it was scarcely with much hope of the result we sought. In our first experiment we simply proved the fact that chloride of silver might, by the method we adopted, be held in suspension in collodion in such a state of minute subdivision as to produce something like an emulsion, free from turbidity or perceptible particles, and without any tendency to precipitation; and that this preparation poured upon paper was sensitive to light; the example which we tried, however, not darkening with prolonged exposure beyond a deep purple or grey.

Since our first brief intimation of the fact we have tried a few further experiments with marked success, and our suggestion has been further tested by a gentleman well known as an elegant experimentalist and successful manipulator. Mr. H. Cooper, whose results have been equally satisfactory. In our own experiments, we dissolved in the first instance, six grains of nitrate of silver in an ounce of collodion, and then having dissolved two grains of chloride of sodium in a few drops of water, added these to the collodion, drop by drop, agitating between each; this decomposed the nitrate and produced the emulsion of chloride of silver which we described. As we before stated, this collodion was insufficiently sensitive, requiring long exposure and lacking vigor. The addition, however, of three or four grains per ounce of nitrate of silver produced a most satisfactory change in the conditions, by giving the necessary proportion of free nitrate to print well.

Paper prepared with this collodion and exposed under a negative, gave a picture of exceeding delicacy, without any lack of vigor, being only distinguished from one produced on albumenized paper and with an ordinary nitrate bath by possessing more marked gradation and modelling. This was toned in an acetate toning bath, receiving a fine tome with difficulty; it was then fixed in a solution of sulpho-cyanide of ammonium, and washed. A print so produced was placed side by side with an ordinary silver print on albumeniized paper from the same negative, before one of our first portraitists for his judgment. He unhesitatingly decided in favor of the collodion print, as finer in color, and possessing more transparency in the shadows, without any lack of vigor, and as possessing a fine surface without offensive gloss. Mr. Cooper's mode of proceeding was to dissolve five grains of chloride of magnesium in an ounce of collodion, and then having dissolved twenty grains of nitrate of silver in a few drops of water, added this chlorided to the collodion. He describes the image produced as having the same characteristics we have mentioned, a peculiar softness and delicacy of gradation.

Another singular fact we have noticed, and which has been confirmed by Mr. Cooper, is, that the image is in this case entirely in the collodion film. We removed a portion of the film, and found the paper underneath without a trace of the image, or any discoloration of any kind. The condition often sought, by which the image may be retained entirely on the surface, is thus obtained.

The conditions by which large sheets of paper may be most easily coated with collodion require a separate consideration. We have already indicated that by dispensing with ether in the manufacture of the collodion one of the chief difficulties, which would be caused by the rapid evaporation of that body will be eliminated. Mechanical appliances may also possibly be contrived which will facilitate the operation. Some ten years ago M. l'Abbé Laborde described an arrangement for coating large plates of glass with collodion, which, as it may be suggestive, we will extract here :—

"On a piece of board, a little broader and slightly shorter than the glass plates employed, fix at each side a rule or lath of wood, forming thus a 'rebate,' in which the plate of glass will slide freely. The two ledges must be sufficiently thick to rise about an inch above the surface of the glass. Another glass plate, rather wider, is then fixed upon the top of the ledges so as to form a kind of cover, distant about a sixth of an inch from the sliding-plate and parallel with it. Both glasses should be about an inch and a half longer than the board in the direction of the length of the raised edges. A hook or stop must be fixed on one end of the board to prevent the movable glass plate from slipping off.

"To use this apparatus it must be laid on a level table, and the sliding-plate (that to be coated with collodion) drawn out from under the fixed plate, as one would pull out a drawer, to the extent of about one-third. The quantity of collodion supposed to be necessary to coat the whole of the surface is then poured on at once, and the movable glass plate pushed in quickly under the fixed one. In this condition the collodion lies in an atmosphere of ether, betweeen the two plates, which prevents evaporation. The board with the plates must then be taken in the hands, and moved in various directions, so as to make the collodion flow over all parts of the glass, and, finally, any overplus must be allowed to drain from one of the projecting corners into the bottle.

"The slow coagulation of the collodion gives great facility in spreading it evenly, and the waves or streaks disappear of themselves. Dust is likewise excluded.

"In order to take advantage of the tendency of collodion (as of liquids generally) to stop at the edges without running over, the ledges and the stop should be bevelled inwards towards the sliding plate of glass, so as to allow the upper surface of the latter to rise a little above them, and be free all round its edges."

How far the use of chloride of silver in collodion may become available to a practical extent we do not now conjecture; but it is certain that for the purposes of the amateur in readily proving a negative, and for some other uses, it will posses advantages well worthy of consideration.—*Photo. News.*

* * *

——Next to carbon the noble metals are the most stable of the elements.

The American Photographical Society.

FIFTY-EIGHTH MEETING.

The Society met at the Chapel of the University on the evening of Nov. 14th, Professor Draper, the president, in the chair.

The Minutes of the last meeting were read and approved.

Mr. Hull, the chairman of the committee of ways and means not having arrived, the Secretary made a statement of the action of the committee since the last meeting of the Society.

Prof. Seely then gave the rationale of the magnesium light, and an account in detail of some experiments with the wire as sold for photographic uses; and gave a practical illustration by burning the wire before the Society. He was of the opinion that the electric light was preferable to that produced by the magnesium wire, and was certain that it could be much more easily managed.

The President asked for a statement of the time required to burn a certain length of the magnesium wire, and the probable cost of maintaining such light?

The specimen burned at the rate of about one foot per minute. Its cost in Europe was about sixcents per foot; but owing to premium on gold and high rate of exchange, was necessarily much greater here, some charging fwenty-five cents per inch, and others fifty cents per foot.

The President considered the great difference between such artificial light and solar light, was that of a limited illumination of the objects; all the shadows appearing very obscure in consequence of the light emanating from a very minute point.

Mr. Chapman gave an account of experiment with oxymel or honey and acetic acid. Flow just enough to cover the plate, and expose wet; develop with ordinary iron developer. The resulting negative was very fine in detail, giving brilliant contrast of light and shade.

Prof. Seely laid before the Society a series of fine photographic views, presented to the Society by Herman Rœttger of Philadelphia. The pictures were made by lenses of Mr. Rœttger's own manufacture and presented many excellent qualities of fine manipulation and effect only to be obtained with fine, quick working lenses.

Prof Seely enquired what the members' experience had been in the use of bichloride of mercury? He had heard considerable inquiry for a remedy for faded negatives which had been strengthened by its use.

Mr. Hull did not approve of its use in any case, he had seen much difficulty resulting from it. Its use is claimed to be a matter of convenience, as giving the effect of a positive, by which the sitter can judge and at once give an order without further proof.

The Secretary had used it, but only under peculiar circumstances where a sitter had insisted on seeing the negative, but could not recommend its use even in such cases, as the sitter was very likely to form an erroneous opinion of such negative.

Mr, Hull gave a description of an instrument used for reflecting photographs greatly enlarged. The instrument consisted of a rectangular box of sufficient size to admit the introduction of two plain mirrors at an angle of about 45° with the back of the box upon which the positive photograph is affixed. The light of two lamps, one on each side, is by the mirrors reflected upon the positive print, before which is placed a portrait combination lens magnifying the image so reflected upon a screen arranged at the proper distance as with the magic lantern or solar microscope.

Some discussion arising upon the cause of the chemical effect known as pinnoles,

Mr. Divine stated that he had been able to avoid all trouble from pinholes by keeping the bath solution well filtered, and by precipitating the free iodide held in suspension by the solution. He did not think that the iodide of silver was precipitated by boiling the bath.

Mr. Johnson moved a vote of thanks to Mr. Rœttger for his donation of photographs to the Society. The vote was unanimously carried.

Mr. Hull gave some further account of the progress and plans of the committee of ways and means.

The Society then adjourned to the second Monday in December.

——All kinds of asphaltum, and the resins produced by the oxidation of essential oils are sensitive to the action of light, and photographs can be produced by their agency.

Memoranda.

[Photographic, Scientific, and Practical.]

Physiological Effects of Cyanide of Potassium.—M. August Busch, writing in the *Photographic News*, describes the action of cyanide of potassium upon the system as follows:—

If cyanic acid be inhaled pure, unmixed with air, instantaneous death is the consequence.

In the chemical laboartories where prussic acid is manufactured, the assistant wdo conducts the process must take the greatest care in breathing; if he inhale a little too much of the escaping gas, he feels his eyesight suddenly leave him, and he isin complete darkness; then he has to retreat quickly or he will fall on the floor.

Electroplaters and gilders who have to work constantly over strong solutions of cyanide of potassium, feel, after a time, if their working-room be not well ventilated, many very bad effects from the poisonous exhalation. Listlessness, weariness in the limbs, dimness of sight, deafness, and loss of memory, are some of the effects produced; painful, obstinate ulcers break out on different parts of the body, especially on the hands, when these have been immersed in the fluid.

Strong cyanide of potassium, when applied to an open blood-vessel, is deadly; applied to a broken skin, it produces great pain, and generally a bad ulcer; and if applied to a whole skin for any length of time, it must have the same consequences, especially if that skin be already decomposed by nitrate of silver; for it must be remembered that the elements of cyanide of potassium are so ready to part with each other, that not only the cyanic acid acts as if it were free, but the potash acts like free caustic potash, viz. dissolves skins, fat, &c., and leaves the deadly poison at liberty to act upon the blood-vessels underneath.

It is, therefore, proper to advise photographers again and again—

1st. To keep their sulphuric, nitric, and muriatic acid bottles far enough from the cyanide of potassium.

2nd. To have their dark rooms always ventilated as perfectly as possible.

3rd. To rather show the stains of honest work, than allow themselves to be rendered unfit for work by employing so dangerous a detergent; but if they *will* apply cyanide to clean their hands never to do so where the skin is broken, nor, if the skin is whole, to continue the operation long, and always to rinse well with water afterwards.

The fact that most of the commercial cyanide is largely adulterated with carbonate of potash does not lessen at all the danger of employing the article; it merely compels the photographer to buy three pounds of cyanide of potassium to do the same amount of work for him that one pound ought to do.

Spontaneous Decomposition of Pyroxyline.—M. de Lucca has recently been making some researches into the decomposition of pyroxyline, with he causes and results, which are recorded in the *Comptes Rendus.* He says :—

In the first place, the condition of keeping the gun-cotton sheltered from the light does not always furnish good results, particularly when the vessel which contains it is badly corked, and is surrounded with a moist atmosphere. Once the reaction has commenced with a slow disengagement of nitrous gas, it is not possible to stop it. This decomposition is greatly facilitated by the action of light, and still more by that of the direct rays of the sun or of artificial heat. A sample of gun-cotton was, after a commencement of spontaneous decomposition in the dark, divided into four portions, one of which was left in the dark, another was placed in the diffused light of a chemical laboratory, the third was exposed to the direct action of the sun's rays, and the fourth to the action of heat supplied by a *bain-Marie* marking 125° Fah. It was observed that, while direct heat produced a vivid reaction upon the gun-cotton, direct light acted with less energy, that diffused light exercised a very slow action, and that in the dark the gun-cotton was decomposed with extreme slowness. The spontaneous decomposition produced four very distinct phases. The gun-cotton, during the first phase of decomposition, slowly contracts without losing its primitive form, so as to occupy one-tenth of its original bulk. It remains in this state several days, and then it begins to dissolve, and is converted into a sort of gummy substance which strongly adheres to the fingers, and had lost its cottony texture; the bulk of it is also diminished one-half, this state constitutes the second phase of spontaneous decomposition of gun-cotton. The third phase commences after a shorter or longer time, according to the temperature of the atmosphere; the phenomenon it produces is not a contraction, but a dilation; so that the cotton which has lost during the second phase nine-tenths of its primitive bulk swells so much in the third phase that it occupies the entire capacity of the vessel which contained it before its decomposition; that is to say, it has become twenty times as bulky after its last contraction : in this state the gummy aspect continues to manifest itself, but the mass is porous and full of cavities, like a sponge. During these three phases there is disengagement of nitrous fumes, which are abundant during the third phase; still this gaseous disengagement diminishes in a sensible and progressive manner, and we then perceive that the matter loses its gummy aspect and yellow color, becomes brittle—so much so that it can be reduced to powder between the fingers—and assumes a white color, like sugar. This state constitutes the fourth phase of cotton which decomposes spontaneously. The time necessary for the accomplishment of those four phases varies according to the temperature of the atmosphere, but at least five months are required for their accomplishment.

Thus gun-cotton, by the slow action of its own elements, and at the ordinary temperature, loses all its primitive properties, disengaging gaseous substances in which we recognise the presence of nitrous compounds and some traces of formic and acetic acid, and leaving for a last residue an amorphous porous matter, comparable in appearance to sugar, very acid, and almost wholly soluble in water, and containing abundance of glucose, which can be easily isolated, gummy matters, oxalic acid, a small quantity of formic acid, and an acid which I believe to be a new one, from which I have obtained a salt of lead, and which I shall examine hereafter.

The glucose resulting from the decomposition of pyroxyline has the taste and aroma of honey; it reduces the tartrate of copper and potassa with great facility; and it ferments in contact with beer-yeast, with the production of carbonic acid and alcohol. The quantity of glucose obtained from 100 grammes of gun-cotton spontaneously decomposed was about 14 grammes.

Gun-cotton of good quality, exposed to the direct action of the light of the sun, soon exhibits signs of decomposition, at first by the odor of nitrous compounds, and afterwards by the yellowish color of the vapors disengaged. All the specimens of pyroxyline that I experimented upon have become decomposed, in a shorter or longer time, under the influence of the direct rays of the sun. Sometimes the change in the gun-cotton begins during the first day of the experiment; at other times the decomposition manifests itself after many days' exposure to solar light. In these experiments the thermometer stood at about 86° Fah., and the temperature seldom rose higher.

Artificial heat acts more energetically than solar light, but always at a temperature more elevated than that produced by the direct rays of the sun. A sample of gun-cotton was divided into two equal parts, one of which was exposed to the direct action of solar light, and the other in an oven to the temperature of 95° to 100° Fah.: the pyroxyline exposed to light decomposed first, the other portion was not altered by the action of 36 hours' artificial heat. There is then a peculiar action in the light of the sun which provokes the decomposition of pyroxyline.

When the gun-cotton is compressed, it is decomposed more readily, both by the action of solar light and by the application of artificial heat. In the month of December 1861, I introduced some pyroxyline into a test-tube, and compressed it with a glass rod; I then made a vacuum, and closed the tube hermetically at the spirit lamp. The gun-cotton thus enclosed has been kept to the present time without showing any signs of decomposition; while similar samples, introduced into cork or ground-glass stoppered bottles, or simply covered with paper, have all changed in a few months, that is to say, during the year 1862. It will then be important to verify these facts upon a large scale, and see if they will afford a ready application to the conservation of gun-cotton for the wants of industry.—*Photo. Notes.*

New Method of Photographic Printing.

BY THOMAS FOX.

[Read before the Photographic Society of Scotland, Nov. 8, 1864.]

GENTLEMEN,—I beg to submit to your notice a process of printing without nitraie of silver; it is very simple, very rapid, and the ingredients required are of the cheapest, and at the same time it produces pictures very distinct, the shades of an intense black equal, if not darker than any known process, and which will not fade from ordinary exposure, from the known chemical combination of the materials used. It is the exact counterpart from printing with nitrate of silver, and whitens the paper where exposed to light, to shaded parts becoming black, and yielding very fine and soft gradations of tone when treated with the following simple process.

The process consists of bringing the bichromate of potass in direct contact with logwood; and the plan I adopt is to sensitize the paper with a solution of the bichromate of potass and sulphate of copper, mixed in the proportion of one part of the former to two of the latter, and to either float or steep the paper for a few minutes, then dry it by the fire in the dark (this paper will retain its sensitiveness for some days, if carefully preserved from light). You then place your copy to the sensitive side, if a glass transparency, with the printed side down, and with a paper print, either with the printed side down or the plain. With the printed side down you get a reversed picture, but which suits admirably for transferring. The time of exposure is much the same as in printing with nitrate of silver: in sunshine from one to three minutes is amply sufficient from glass, and for a papcr print or piece of printing it will be rather longer, according to the thickness of the paper, the thinner it is the better. Of course, in dull weather, it is proportionable longer; at the same time, I would say, paper thus prepared is much more sensitive than the silvered, and will print considerably quicker.

I have then a strong decoction of logwood ready, and filter such a quantity as will float the print. I add a little hot water to hasten the development, float the sensitized picture from half a minute to a minute, print-side down, and then, holding it by one corner gradually raise it from the logwood; a perfectly delineated copy is the result. I then dip it in hot water, which carries off the superfluous logwood that may be hanging to the paper, then dip it in hot or cold water, and varnish. This gives a very distinct picture, with the shades of a deep black, and lights of a rather greyish-yellow tint. In order to obtain a white ground, I use a weak solution of alum, put in hot water.

The same logwood will do a great number of prints. The sensitizing solution retains its power until dried up. There is no danger of baths going wrong, as in the silver baths; and the tedious process of toning, &c., is avoided, not to speak of great uncertainty and variations in these processes; and it will do all that the carbon process professes to toning, &c. The whole process may be done in a few minutes; the paper, being sensitized and dried by the fire at once, may be immediately exposed, developed, and varnished.

For transferring the unvarnished print, I simply pass it under a roller-press, which gives a beautiful impression on albumenized paper, leaving the ground pure white; it also transfers to cotton linen, glass, stone, wood, and other material.

I may mention that by varying the strength of the sensitive solution, and the intensity of the logwood, many different shades of color may be obtained, as you can get blue and purple, and deep black to the lightest shade of black. I see no reason why this process may not also be used in the camera, with an albumen or other transparent medium, using logwood as a developer.

I would also take this opportunity of mentioning that it is above a year since I first began these experiments, and made them with plain paper. Some of these I forwarded to your president, Sir David Brewster, who was kind enough to acknowledge them, and recommended me to continue these experiments. I found the plain paper did not clear in the lights well. I tried salted paper, which gave very good results, but still dark in the lights; I then tried albumenized paper, and as yet find it best; but I believe gelatine paper would perhaps be the best.

It is, I believe, as yet by far the simplest and quickest process that has been brought out, consisting of this :—

1st. The sensitizing solution, easily made.

2nd. The logwood, equally so.

And in working these it is easily simple, and sure. Float the paper for five minutes or shorter, if steeped; expose for a short time (observation will determine the time); then develop with logwood, and the whole operation is done, with exception of varnishing, which is just poured over the picture. For this process I have obtained letters patent; and from the pictures produced I hope you will think favorably of the first results made public. I have no doubt they may be greatly improved, upon further trial; and I trust that these my efforts may not altogether be unworthy of the notice of your Society.

Let us have More Amateurs.

BY H. J. MARIAN.

I WOULD beg leave to offer the following few remarks to the attention of the readers of your valuable Journal. I read the Journal, and have got some valuable information from its pages, and as a friend of the art would like to see the following suggestions put into practice.

Photography as an amusement should be more encouraged among the American people, and those having leisure should apply themselves to the advancement of the art, as well as themselves. The art deserves encouragement from many who do not practice it, and if a school for amateurs was opened in this city, no doubt many would embrace the opportunity of qualifying themselves for that study.

In England the amateurs may be counted by thousands, here they do not amount to more than a few hundred, indeed if so many, and yet pictures taken by those who have adopted the art as a pleasure may be considered equal, if not better, than those of many who profess to be photographers for the public. It is to be hoped that at no distant day we will hear of a move in the right direction—in the establishing of a school where those whose tastes may fit them for the selection of the camera and chemicals.

With a few practical lessons a person of ordinary intelligence might make his time pass pleasantly, and at the same time benefit himself and others. As to quantity and variety of subjects there would be no difficulty in selecting them.

NEW YORK, Dec. 12, 1864.

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The Niellograph a Humbug.

MR. EDITOR,—You say in your "*Ambrotype,*" that Niello paper answers all the purposes of the melainotype, is easier used, and is more economical; and that it bids fair to supersedet he melainotype, &c.

I bought of C. C. Kelsey, of Cincinnati, some Neillo paper manufactured by Seely & Garbanati, Photographic Chemists, N. Y, for which I paid 40 cents per doz. for 1-9, and $1 75 per doz. for ½ size.

According to the directions for using, they have to be cleaned; a melainotype does not; and you would not advise any one to attach the paper to dirty glass to be put into the bath; so how is it "easier used?" The 1-9th melainotype plate costs a fraction over eight cents per dozen, and the ½ costs a fraction over twenty-six cents per doz. Now where is the *economy*, and how is it going to *supersede* the melainotype?

If you varnish the Niellograph, it must be with a varnish that will dry without heat, and that is something that I have not yet seen; neither have I been able to buy any that would dry very well *with* heat. Every manufacturer of varnish advertises his varnish as *the very best* that is sold, but I have never been able to find any that would not ruin a negative; so I use nothing but gum arabic. The fact is the most of the varnish that is manufactured, or at least such as I have been able to get, is almost as big a humbug as Niello paper, and that is the biggest humbug that I have tried since I have been in the business.

I did not write this for publication. C. J. B.

[We might say many things in reply to the above. We offer only a few simple suggestions. One of the most striking evidences of progress is the discovery that our wisdom of other days was only folly. When the Niello paper was first introduced, very few things used in our art were so much bepraised. In England the praise was louder than here, and during one year nearly as much of the article was exported to England as was sold in America. Now C. J. B. has found it a humbug.

When the article was introduced, it was sold at prices and quality to compete with the Melainotype plates, and had the manufacture (interrupted by the dissolution of S. & B.,) been continued, there is little doubt that it would have maintained its relative position in quality and price.

Finally, there are still many who do not agree with C. J. B. At the present time there are some gentlemen of good judgment and knowledge of the business who propose to revive the manufacture. —Ed.]

The American Photographical Society.

FIFTY-NINTH MEETING.

THIS meeting was almost exclusively occupied with the discussion of plans for the future welfare of the Society. As the Society's domestic affairs are of little moment to the public we omit details.

The committee on location reported that they had received subscriptions to the amount of over $500. Immediate steps are to be taken to secure and furnish the room recommended by the committee, on Broadway corner of 4th St. The valuable collection of photographic curiosities of the Society will in future be more accessicle to the members, and will probaby be arranged for permanent exhibition.

The Society adjourned to meet on the second Monday in January.

Editorial Department.

———The next number of the Journal will appear at the new year, and will begin the second half of VII. In the coming week of good will and festivity we ask to be remebered. What more proper for a photographer, especially at such a time, than to do something for the progress of the art; and what can be done more directly to that end than to assist in the improvement of this Journal? Among the many particular ways of carrying out good intentions to the art we venture these two, to surprise a friend by the presentation of a subscription to this Journal, and to surprise the publisher by the formation of a very large subscription club.

———The advance in subscription rates we are pleased to know is kindly received by the photographic public; it will not lessen the subscription list. Our offer of taking subscriptions at the old rates up to the 10th of December, was accepted by a legion; we have had the pleasure daily of reaping a greenback harvest. There is however a legion of others who have unwisely delayed; these will receive the present issue in a yellow wrapper; walk up, gentlemen and ladies, to the captain's office.

———Our readers now have the details of the Wothlytype process. The full knowledge we now have seems to justify the unfavorable opinion we based on its antecedents. The process is more expensive, more difficult, and more uncertain than that ordinarily practiced; and at the same time its results are probably inferior. The process moreover has little novelty; it is even doubtful if the patent could be sustained.

Yet it is likely that the general interest in the subject will be productive of good. It incites hundreds of able men to experiments in a new direction, and this skilled labor must develop something useful for the art or the science. We also are quite willing to concede that for some special purposes the process as it stands may have peculiar advantages.

——In a multitude of councillors there is safety. It has been proposed that the queries of photographers be sent to the Photographical Society for discussion, and that the discussions be reported in this Journal. The suggestion seems to all who have spoken of it a very good one, and we will assist in carrying it out. Any proper questions sent to us for the purpose will be duly attended to; or the same may be addressed to the Secretary, Oscar G. Mason, Esq., No. 9 Bank Street. This arrangement we are persuaded may become a very important feature of the Society and the Journal. The best judgment in the city will be accessible to photographers in all parts of the country. We hope we shall be able to put the project under trial at the next meeting of the Society, and in the Journal of Jan. 15.

Minor Correspondence.

J. S. S., of Ia.—"Can you inform me of the merits of John H. Simmons' new solar camera. Does it possess any advantage over other styles? Last summer there was a rusty looking chap around selling recipts for making photographs, &c. He pretended to hail from Chicago, but found that —— was his prompter. However I did not invest, but know of several who did, and they brag very much about their bath preserver. They say if it is put in a foggy bath that it will work clear until it is all consumed. I do not have any foggy baths, and if I had would not use that, but would like to know for curiosity what it was. Can you obtain for me some good photographs of Grant, Sherman, Sheridan, &c.? I have sent several times to ——, but the pictures were miserable, and don't want any more such." ... We have not seen Simmons' solar camera. It is not used here. It seems to be what was once called the pantograph, furnished with a condensing lens. We should prefer the ordinary darkened room for very large work. In the city we have no place for a box as large as a house. ..We know nothing of the rusty chap and his receipts; perhaps some reader can give the information. ..The cards of celebrities are generally miserable photographs. The firm you name is among the first in their line. You should have some friend to select the prints for you.

Tr J. L., of Ill.—"I would like to know if Swan's carbon printing process is patented in the United States. If so, who owns the patent, and do competent judges consider it a desirable process? I would like to practice it if it is good and not too much work." ....Swan's process is not patented here. We know of no one who considers it a practical business process. It is ingenious and curious, but not useful in a pecuniary sense.

D. H. **Brooks**, of O.—"I have found that Howe and Stevens family dyes, especially the fluids, are well adapted to the coloring of photographs on albumen paper, they answer for the complexion as well as the dress; try them."....These and other dyes are of pleasing tints and are easy to use. Unfortuuately, however, they will fade. Professional colorists will have nothing to do with such things.

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Tannin, and Its Impurities.

BY EMERSON J. REYNOLDS, F.R.G.S.

Some time since, when employing Major Russell's tannin process with simply bromised collodion and alkaline development, I had some trouble in keeping the prepared plates even for a very short time; and, when exposed or developed a day or so after being prepared, they showed a decided tendency to stain, and sometimes a general clouding of the film was apparent. The cause of this annoyance was at once sought for; and, though inclined to believe that the plates after sensitizing, had not been sufficiently freed by washing from traces of nitrate of silver, yet, on further experimenting, I was compelled to attribute the fault to the tannin solution employed. This had been prepared according to the method described by Major Russell in his work on *The Tannin Process* (page 55, second edition), and which had hitherto worked well with me. A fresh solution, made with a new sample of tannin, gave me satisfactory results.

I have recently examined a number of different specimens of commercial tannin, with a view to make out the nature of the impurity or impurities which give rise to the unpleasant effect above recorded, and which probably cause the "insensitiveness" noticed by Major Russell and others when working with certain samples of tannin. A strong aqueous solution of each specimen of commercial tannin in my possession was submitted to examination by the spectrum absorption method, by which means the presence of chlorophyll, or the green coloring matter of plants, was easily detected in several; and it is worthy of remark that the samples in which it occured were generally less sensitive than those in which it was absent. As chlorophyll is a body which is prone to alteration, I directed my attention to removing it from the aqueous solution; for, though chlorophyll *per se* is but little soluble in water, the presence of tannic acid increases its solubility. After trying with indifferent success many plans for preparing the tannin solution so as to get rid of the impurities at the same time, I hit on the following, which is very simple and effectual, and much less troublesome than the repeated filtration of the aqueous solution hitherto necessary :—

Dissolve one hundred and twenty-eight grains of tannin in two ounces of distilled water; pour the solution into a cup placed in boiling water, and, when the liquid is sufficiently heated, add to it about thirty grains of kaolin which has been previously washed with distilled water, and then ignited; the mixture is then well stirred, and the cup containing it kept surrounded with hot water for five or ten minutes; the whole is then filtered, and to the bright filtrate one ounce each of alcohol and of water are added. The resulting standard solution will contain nearly four grains of tannin in each fluid drachm, a small quantity of the acid having been removed by the kaolin.

The advantages of the mode of preparing the tannin solution above described, are :—1. Several impurities—amongst others, chlorophyll—are quickly removed; and, 2. The filtration of the aqueous solution, instead of being tedious, is easily accomplished, and the filtrate obtained is bright and clear. I have treated many old resinised and generally impure samples of tannin in this way, and found them all to work equally well, photographically speaking. In addition to alluding more particularly to the impurities usually found in commercial tannin, it may be of interest to give a short account of pure tannic acid, its preparation and properties, according to the most recent and trustworthy observers.

The word "tannin" is often indifferently applied to the acid astringent principle found in many plants, in the bark of certain trees, and in the excresences of different specimens of oak. The term is meant, in photography, to apply simply to the acid obtained from the gall-nuts which are produced by the puncture of an insect in the *Quercus infectoria*. Hence the tannin prepared from nut-gall is distinguished by the name "gallotannic acid." It was formerly believed that but two varieties of tannic acid existed —one giving a bluish black precipitate with a salt of peroxide of iron, and the second an olive-green precipitate with the same reagent. But we now know that these reactions serve only to divide the "tannins" into two groups, each division being made up of individual members. We may here note that the character above all others which distinguishes gallotannic acid from its congeners, is that of yielding pyrogallic acid when subjected to destructive distillation.

Guibort's analysis of the best Aleppo gall-nuts gave of tannic acid 65 per cent; gallic acid, 2; ellagic acid, 2; gum, 2·5; starch, 2; oil and chlorophyll, 0·7; together with a little sugar, extractive albumen, fibre and salts. In practice, gall-nuts generally yield about 40 per cent. of tannic acid.

The tannin is extracted from gall-nuts by percolating the latter finely powdered, with commercial ether, which always contains alcohol and water. The liquid which trickles through the powder into the receiver separates into two layers. The lower stratum is a strong aqueous solution of tannic acid and other extractive matters, with a little ether; and the upper one consists of pure ether, most of the gallic acid, and some of the chlorophyll. The lower layer is then separated from the upper one, and repeatedly agitated with fresh ether. When the latter is drawn off the aqueous solution is evaporated to dryness, either with or without previous filtration. The tannin thus prepared generally contains a little resinous matter, some ellagic acid, and chlorophyll, and occasionally traces of oily matter, soluble in ether. The first two bodies are easily separated by dissolving out the tannic acid with cold water; the resinous matter and ellagic acid, being insoluble in that menstruum, remain behind, though they are both difficult to get rid of by simple filtration. However, as already mentioned, the chlorophyll is removed, and the liquid easily cleared by simply warming with a little clean kaolin. The oily matter may be got rid of by taking the precaution to moisten the filter well previous to pouring on it the solution of tannic acid. If the light transmitted by the filtrate be examined with a prism, the characteristic bands of absorption belonging to chlorophyll will be found wanting, thus proving the absence of the latter body.

The chemical properties and relations of gallotannic acid are particularly interesting, as tannin and its derivatives, gallic and pyrogallic acids, have been more or less employed in photographic processes since the earliest days of our art-science. The most striking properties of all three are, therefore, well known, so that my remarks shall be confined to a notice of certain relations which are not generally mentioned in the ordinary text-books. Gallotannic acid, when first obtained, is a colorless, amorphous powder, which easily turns yellow when exposed to light. It dissolves very freely in water at ordinary temperatures; in absolute alcohol it is soluble with some difficulty, but rectified spirit dissolves it readily. It is but slightly soluble in ether. The aqueous solution is readily precipitated by the addition of sulphuric or hydrochloric acids, tannic acid being much less soluble in acidulated than in pure water. Common salt and sal-ammoniac also precipitate the acid from its aqueous solution, but nitre has no effect.

Tannic acid, when moist and exposed to the influence of the natural ferment or pectase of the gall-nuts, is converted into gallic acid; and the latter, when heated, is converted into pyrogallic and carbonic acids. Pyrogallic acid may be also directly obtained from tannin by destructive distillation of the latter. The most distinctive character of tannin is the power possessed by it of forming an insoluble compound with gelatine; hence the production of leather. Gallic acid *per se* cannot render gelatine insoluble, but it is worthy of note that the addition of a little gum arabic enables it to do so.

When exposed to the influence of ozone the deportment of tannic acid is remarkable, According to Schönbein it assumes at first a yellow tint, and then a deep brown color; it then becomes pasty and gradually liquifies from the formation of oxalic acid. When the action of the ozone is still prolonged the sole products are carbonic acid and water. Gorup-Besanez has shown that the same decomposition ensues if ozonised air be passed through the aqueous solution of tannic acid. The salts which tannic acid forms with bases are very ill defined, and do not possess any particulars interest. Tannin is a powerful reducing agent, since it is capable capable of reducing metallic mercuryfrom the solution of the nitrate, and calomel from corrosivesublimate; also sub-oxide of copper from the ordinary sulphate of copper. With silver or gold solutions reduction to the metallic state is quickly effected. On this observation Dr. Unger has baseda mode of silvering the interiors of articles of glass or porcelain.

The following is his method : Add to a moderately-strong solution of nitrate of silver, contained in the vessel which we wish to silver, a quantity of an alcoholic solution of tannin; stir quickly and plunge the vessel into warm water. After about half-an-hour the silver will be found deposited in the form of a brilliant mirror, which admits of polishing. The object of heating the solution immediately after mixing it is to ensure quick reduction, and to avoid the formation of a brown, sparingly soluble compound with sub-oxide of silver. The metallic silver so produced is firmly adherent to the surface on which it is deposited. Dr. Unger states that he has also obtained a brilliant metallic coating from a saturated solution of sulphate of copper by the same solution of tannin but the precipitate appears to me to be the sub-oxide, and not metallic copper—*Brit. Journ.*

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On the Photographic Sensitiveness of Certain Combinations of Iron and of Uranium.

BY P. LIESEGANG.

PAPER impregnated with the ammonia-citrate of iron is yellow, and under the influence of sunlight takes a decided brownish tone after an exposure of some minutes. The malate of iron acts in the same manner; but the oxalate of iron changes in color very slightly, prints upon this salt being almost invisible before the development. When a neutral solution of the chloride of gold is applied to these three classes of paper, after they have been exposed for an equal period to the action of light, the citrate and oxalate papers take very quickly a decidedly vigorous blue-black tone; and although the influence of the light is much more evident upon the citrate as compared with the oxalate, prints on these two papers finally attain an equal vigor. The tone of the citrate is purple; that of the oxalate approaches more nearly to a brown. The print upon the malate of iron is not darkened by the chloride of gold; it even disappears in this solution. If the exposure to light is continued for a long time, the citrate and oxalate prints receive the gold of the toning bath in a brilliant yellow metallic form. The nitrate of silver and the ammonia-nitrate of silver will develope these prints as well as gold, only the tone is blue. A mixture of citrate and oxalate of iron is not more sensitive than each of these salts alone.

When albumenised paper is prepared with a concentrated solution of the ammonio-citrate of iron the albumen is rendered insoluble by the exposure to light, and repels water. Perhaps this salt might advantageously replace the bichromates in photography. Very curious prints may be obtained on this paper by washing it after the exposure to light under a positive, and then plunging it in a solution of fuchsine. The *design* takes on a very brilliant red color, and the *ground* a greenish bronze tone.

By treating the paper prepared with the oxalate of iron after exposure to light with a solution of ferrocyanide of potassium, a brown print on a blue ground may be obtained.

The citrate of the protoxide of iron is also changed by the action of light. With a positive it gives a brown print on a deep yellow ground. When washed by the ferrocyanide the ground becomes light blue, while the design takes on a much deeper blue.

As M. Niépce de St. Victor has shown, the salts of the peroxide of uranium can replace the salts of the peroxide of iron in the chrysotype process of Herschel. The salts of the peroxide are changed by light into salts of the protoxide, which has the power of reducing gold and silver when in a state of solution. Fine paper is floated on a solution of nitrate of uranium at twenty per cent.; it is then dried. Upon exposing it under a negative to light, and then placing the brown print in a dilute solution of the chloride of gold, it takes a violet tone. These prints are fixed by merely washing them in water. M. de Brebisson exhibited some prints made in this way, at the third exhibition at le Palais de l' Industrie, in the Champs Elysees, in 1859. They were perfect, and were quite as successful as some silver prints taken from the same negatives. It seems that M. Wothly, of Aix-la-Chapelle, employs a similar method for his prints obtained without silver salts, only he dissolves the uranium salt in the collodion.—*Brit. Journ. of Phot.*

Experiments in Uranium Printing.

BY G. WHARTON SIMPSON.

(Read before the South London Photographic Society Nov. 10th, 1864.)

Pending the publication of the details of the new patent printing process it may be interesting to bring before the members a *resumé* of what is already known, and what has already been done in uranium printing. The discovery of the photographic use of uranium has been claimed for M. Niepce de St. Victor, who entered a provisional specification at the Patent Office, in February, 1858. But, so far as we have any record, Mr. Burnett had given detailed experiments, and specimens of the results, at least twelve months prior to that date. and long before M. St. Victor, had made any public allusion to the process. The principle upon which uranium printing is based had, however, been published many years earlier than this by Sir J. Herschel, in whose cyanotype and chrysotype processes the germ of uranium printing is very definitely involved.

The principle to which I refer should be comprehended at the outset; and I will endeavor, for the benefit of the less scientific photographer, to explain it as familiarly as possible. As early as 1840 Sir J. Herschel discovered thaf the persalts of certain metals were changed by the action of light into protosalts, these protosalts possessing a reducing power which was not possessed by the persalts. Thus ammonia-citrate of iron, which is a salt of the peroxide, under the action of light parts with an atom of oxygen and becomes a protosalt. Now, as most photographers know, the protosalts of iron reduce chloride of gold into the metallic state; paper coated with the ammonia-citrate of iron and exposed under a negative, undergoes a change to which I have referred, but the image produced is only faintly perceptible to the eye, the image, however, consisting of a protosalt of iron. On plunging it, therefore, into a neutral solution of chloride of gold, the gold is reduced whenever it comes into contact with the protonitrate, and produces almost instantaneously a purple image, consisting of metallic gold. If a solution of nitrate of silver be used instead of the gold solution an image in silver is obtained. This method of praducing pictures is termed the chrysotype process.

Mr. Burnett discovered that the salts of uranium behaved in a manner similar to those of iron. The salts of sesquioxide of uranium ($U_2 O_3$), under the action of light, part with oxygen, and are reduced to salts of silver, gold, and some others to a metallic state. The image produced consists, as will be seen, chiefly of the metal—silver, gold, &c.—which is reduced, the uranium rather acting as a reducing agent than forming the image itself. The oxalate, tartrate, citrate, formiate, benzoate, saccinate, and some other salts of uranium may be used, but the nitrate, as the most available, has been most commonly employed in experiment.

I may now briefly describe a few of my own experiments in this direction, which members interested in the matter may easily repeat. The nitrate of uranium is readily soluble in water, and all my earlier experiments, made some seven or eight years ago were performed with aqueous solutions. I shall confine my present remarks to experiments made within the last month, with collodion as a vehicle, which presents many advantages,both in simplicity of operation and excellence of results.

First prepare a uranised collodion. The pyroxyline most suitable for the purpose is that which yields a tough, horny film. Collodion made from the powdery kind sinks into the paper and dries quite dead. The quantity of pyroxyline will depend much upon the surface required, but five or six grains to an ounce of solvents will give a collodion which is easy to work, and gives good results. Before mixing the collodion, take the alcohol and dissolve the nitrate of uranium in it, by triturating them together in a mortar. A somewhat alcoholic collodion will answer the purpose best; take then two ounces of alcohol and triturate with it about 150 grains, or from that to 180 grains, of nitrate of uranium. Possibly the whole may not be dissolved, but a saturated solution will be obtained. To this add eighteen grains of pyroxyline and one ounce of ether; agitate, and leave to settle. This constitutes the uranised collodion. Those who have not facilities for making collodion may take any sample of commercial plain collodion, providing it give a glassy, tough film. Make a saturated solution of nitrate of uranium in alcohol, and add of this from one-fourth to one-third to the plain collodion.

I have laid some stress upon the use of pyroxyline giving a glassy film, because, in making my experiments, I have made two or three samples from cotton giving a good negative collodion, but which has dried dead, and in some instances opalescent when applied to paper. It will probably be found also, that the sizing of the paper by some substance—probably gum tragacanth would answer—which may retain the collodion on the surface will improve the result very materially.* In my experiments I have used the ordinary photographic paper, medium Saxe and Rive without any preparation. On the latter the collodion is retained pretty well on the surface, but iron spots are troublesome; with the Saxe the collodion is absorbed considerably.

Pin a piece of paper, say whole-plate size, by three corners on to a piece of board a trifle narrower than itself, allowing the paper to project a little over the bottom edge. Now pour the collodion on to the paper, just in the same manner as in coating a glass plate, pouring back the surplus into the unpinned corner, and then hang up to dry, When dry, expose under a negative. The time will vary not only with the light and negative, but with the treatment which is to follow. For the first form of treatment, I shall describe, let the exposure be a little less than for excited albumenised paper—say ten minutes in sunlight. On examination, a faint image will be discernible, the action of light having slightly darkened the nitrate of uranium. Wash for a few moments in distilled water, and then plunge into a thirty-grain solution of nitrate of silver. The effect is very striking; a vigorous image flashes out immediately, the complete reduction of the silver taking place within a minute or two at furthest. If the exposure has been correct, a vigorous bright image will be the result, varying in tint according to the quality of the negative. A soft negative requiring short exposure we have found generally yields a print of elegant biastre tint; a more brilliant negative will yield tints varying from chocolate-brown to purple. An under-exposed picture does not yield a tint deeper than bistre in any part, whilst an over-exposed print will yield a deep, almost black, tone of purple-brown. The print may be rinsed in several changes of distilled water, and is finished.

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* In preparing paper so as to keep collodion on the surface, two or three things require attention. India-rubber or gutta-percha would not answer well because the collodion would exercise some solvent action on them, and so penetrate. Gelatine or similar substances form compounds with silver, and would not answer where silver is used. Probably gum tragacanth possesses the balance of advantages.

Repeat the same process, and obtain a somewhat deeply-printed image. After treating with silver and rinsing thoroughly in distilled water, place the print in an alkaline gold-toning bath. I have used various, but chiefly an old acetate bath, made twelve months ago, but not used. In a few seconds the image is changed nto a deep purple or black. Over-toning produces a steely black which is cold, metallic, and unpleasant. The print is slightly reduced in vigor, especially if it has been in the slightest degree under-exposed. Wash in distilled water, and the picture is finished.

Expose a piece of the same prepared paper under a negative and print very considerably deeper, until a well-defined grey-colored image is obtained. An hour's exposure in sunlight will probably be required. In my own experiments the uncertain and bad quality of light has rendered exact register of time difficult Rinse for a moment in distilled water, and then plunge in a bath of chloride of gold containing about three grains to the ounce. In a few seconds a beautiful image of gold is obtained, varying in color, according to the character of the negative and amount of exposure, from a rich ruby tint to purple, and in some cases to a bluish black. Wash thoroughly, and the picture is completed. If the print be often exposed the image will often, instead of becoming deeper, disappear, the unchanged and very slightly changed uranium being soluble in chlorides, especially if any free hydrochloric acid be present. If over-exposed, the blue-black tone is produced. Chloride of gold may be mixed with the uranised collodion, but has in our hands given a grey poor image.

In all these cases the operations are simple and tolerably certain. The gradation of the image is very perfect and beautiful, and although the vigor is greatest by transmitted light, the image, in the two first cases, in many respects, of appearance as well as constitution, resembling a developed print; still there is no lack of vigor or delicacy by reflected light, and the prints possess considerable beauty. There are several other modes of toning, developing, or intensifying—for the operation of bringing out a uranium print has analogies to each of these processes—but I have described those I found most successful. A very prolonged exposure, immersion in a solution of bichloride of mercury, and then in a solution of nitrate of silver, gives a grey image which I do not like. Silver and iron, red prussiate of potash, platinum, &c., may be used for bringing out the image; but it is not necessary to enter into details now.

Having tried these experiments with a simple uranised collodion, another interesting series may be tried with the metals combined, which have been used separately. Take the uranised collodion and add to each ounce from three to ten grains of silver, dissolved either in a few drops of distilled water, or in rectified spirit by trituration in a mortar. The collodion will thus contain the reducing agent and the metal to be reduced.

Coat paper with this collodion, and when dry, expose under a negative. The paper will print, giving a good visible image, as in silver printing, but of a bistre tint. The depth of the tint and the time of exposure appear to depend considerably on the proportion of silver present. With three grains of nitrate to an ounce of collodion, the image was not very vigorous; and the printing was slower than with silvered albumenised paper. With soft negatives the image was weak and poor; but with vigorous negatives a good result, delicate and forcible, was obtained. However deep the printing the color was never deeper than brown, and still of the bistre hue. If this tint be intended to be retained in the finished picture, the printing must not be carried much, if any, deeper than appears satisfactory, and a thorough washing in distilled water finishes the operation.

If a purple or black tint be desired, the same tint must be exposed longer, until the image is considerably deeper. It is then well rinsed in distilled water, and placed in an ordinary gold-toning bath—I used the acetate. The toning is slow, and reduces the depth of the image, which, if weak at first, does not improve in this operation. If, however, the image be vigorous and sufficiently printed, it improves in the gold bath, and may be made to assume the exact tone of any ordinary silver print. It is then well washed in repeated changes of water. A better toning effect is produced by a gold bath, to which I shall refer presently.

The prints produced by this mixture of uranium and silver most resemble, in general behavior and effect, the Wothlytype prints, both in their color in the printing frame, and when toned with gold. Dr. Schnauss having analysed one of Herr Wothly's prints, states that he found iron and gold, and another analyst professes to have found gold and silver. Speculation on the subject is probably somewhat a useless occupation, seeing the details must be published ere long; but I might suggest that it is not improbable that uranium, silver, and iron, may all enter into the composition of the collodion used in the patent process. Ferro-tartrate of silver was employed in one of the many beautiful experiments of Sir J. Herschel in the early days of photography, and it is not impossible or improbable, from the nature of the results then obtained, that the addition of the tartrate of uranium—the most sensitive of the uranic salts—might produce results which would well repay the experimentalist.

A question will naturally arise, however, in regard to the greatest number of experiments I have described, as to how the prints are fixed, seeing that silver enters into the operations, and, indeed, chiefly forms the image. With the exception of the experiment in which the uranic print is plunged into gold immediately after exposure, and the image formed of ruby or purple gold, all the aictures really consist of silver images, uranium simply acting as the reducing agent, as gallic acid, applied in a different way, does in the usual form of developed silver prints. How is it, then, that no fixing process is employed? The answer is, that nitrate of silver only is employed, which is soluble in water, and not chloride of silver, which is only soluble in hyposulphites, cyanides, sulphocyanides, ammonia, &c. Nitrate of silver being soluble in water, it is alleged, may be removed by plentiful washing in water.

I do not, however, think this answer satisfactory, and for several reasons. Primarily, it is a very uncertain thing whether the samples of paper which reach the photographer are free from chlorides. It is more than probable that many samples contain quite sufficient of a chloride to combine with the silver, the moment they come into contact, and form a compound insoluble in water which will assuredly reveal its presence in time by the discoloration of the print. Again: even if the paper were free from chlorides, unless the most scrupulous care were now used to employ only distilled water in washing, insoluble salts of silver, carbonate, chloride, &c., would be formed in the paper, and prove detrimental to permanency. Again: whenever the print is toned in a bath of chloride of gold, unless every trace of nitrate of silver has been first removed by washing in distilled water, it would be converted into a chloride in the toning bath of chloride of gold. And, finally even suppose the danger from chlorides to have been eliminated the danger of forming organic compounds of silver from the contact of the nitrate with the sizing material of the paper provides a fresh risk of discoloration and fading.

I strongly incline to the opinion, then, that with our present knowledge of the subject, we cannot safely adjudge any print to be permanent in the production of which silver forms an element, without having been treated with some solvent of the chloride, and other salts of silver insoluble in water.

In the experiments I have made I have, therefore, submitted many of the prints produced by the processes described to the action of sulphocyanide of ammonium. A very slight reduction in depth has been the result, but generally an improvement in the brightness and clearness of the image. The best result of all has been produced by the use of a toning and fixing bath in one, consisting of one ounce of sulphocyanide of ammonium in three of water* and one grain of chloride of gold. The first result of the mixture is the production of an orange or red precipitate of sulphocyanide of ammonium, which is, however, rapidly redissolved. Argento-uranic prints immersed in this bath rapidly assume a purple or black tone, and any trace of insoluble silver salts is removed at the same time. The prints are made safe, and the general result is better.

New Developing Process, requiring Little or No Intensity.

BY WILLEM MAC-NICOL.

In consequence of the trouble and disadvantages attendant upon the intensification of negatives, I have conducted several experiments with a view to supersede it.

After many trials, I have succeeded in obtaining splendid negatives by the addition of ammonia and sulphate of copper to the ordinary developer. The negatives so developed are clear and clean, and possess much detail. They also require less exposure than usual.

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* It is probable that a very much weaker solution than this will be sufficient.

The formula is as follows :—

Protosulphate of iron	2 drachms.
Sulphate of iron	1 drachm.
Water	10 ounces.

When dissolved add—

Ordinary alcohol	4 drachms.
Glacial acetic acid	2 "
Liquor ammonia	20 drops.

Shake well and filter.

If, instead of the protosulphate of iron, ammonia-sulphate of iron be used, then the liquor ammonia is not required.

If the sulphate of copper be found to dissolve too slowly, its solution will be accelerated by being placed in warm water.

Should it prove requisite to intensify the negative, the following may be used :—

Distilled water	1 ounce.
Pyrogallic acid	4 grains.
Citric acid	3 "

to be mixed in equal proportions with the following :—

Distilled water	2 ounces.
Nitrate of silver	10 grains.
Glacial acetic acid	2 drops.

The fixing is performed as usual.

On Printing Transparencies for the Stereoscope and Magic Lantern.

BY JOSEPH SIDEBOTHAM.

Read at a meeting of the Photographic Section of the Literary and Philosophical Society of Manchester, on Thursday, Nov. 3rd, 1864.

Without going into the vexed question as to when the stereoscope was invented and who invented it, we may, I think, assume as probable that if the popular form, viz., the binocular, of Sir David Brewster, had not been invented, the stereoscope would have been merely an optical curiosity, and even now known of but by very few. We may also, I think, take it for granted that, but for the very opportune discovery of photography, even Sir David Brewster's form would have been but little known and cared for; and if our respected member, Mr. Dancer, had not invented the binocular camera, the stereoscope and its attendant pictures would not have been, as at present, found in almost every home. Only those who were then engaged in photography will remember the absurd distances at which photographs were taken apart and expected to form natural images in the stereoscope, and the discussions in the journals ridiculing Mr. Dancer's idea, that the pictures should be taken only at three inches distance. Now however, that distance is universally adopted, and few know or think to whom they owe this apparently simple idea, which was first made public at a meeting of our Society.

Very early in the history of the stereoscope, transparent views, printed on albumen, were produced in France, and were eagerly purchased at the high price at which they were sold; and since that time various improvements have been made in their production, but the price is still very high. No one, I think will venture to compare even the very best paper prints with glass transparencies as to beauty; but the lowness of price enables persons to possess a collection of them, when the glass ones would be beyond their means. In the present paper I shall endeavor to show that these pictures can be easily produced equal to any that are to be met with, and at a price not greatly exceeding paper ones.

I will, in the first place, mention a few of the plans in use for producing stereoscopic transparencies, plates coated with iodised albumen, albumen on collodion, or collodion and the Fothergill process. These are all more or less troublesome to prepare and tedious to develope. The tone produced is often unpleasing, and there is a difficulty in producing two prints of the same tone.

The negatives must be cut before printing, or a shifting frame used, such as the one exhibited, the negative and plate pressed close together, and exposed either to daylight or artificial light. In using the shifting frame the negatives require to be varnished, and this introduces a transparent film of appreciable thickness, which prevents actual contact, and then perfect sharpness is not obtained. To obviate this the frame may be placed at the end of a deal box, and the light admitted either through a lens or a small hole.

The tone and character of these pictures are not good for exhibiting in the magic lantern—a use to which many people now put their stereoscopic slides, and one which will become much more general than it is. Tannin plates are in some respects better than the above, but the tone is generally bad, and there is a peculiar mistiness on the screen when used for magic lantern pictures. Plates prepared with gelatine, oxymel, and acid syrups, give beautiful pictures, both for the steroscope and magic lantern, but are all troublesome to prepare and dry, and all require that both the negative and the print should be on plate glass, if really good pictures are wanted; and the true amateur is not satisfied till he can equal the best productions of those who offer them for sale.

The other modes of printing transparencies are by using the wet collodion process, either in the camera, or by allowing the negative to be be almost in contact in a frame at the end of a box, and permitting the light to pass through a lens or a small opening at some distance in front. This latter plan was one made use of ten or twelve years ago, but was given up on account of the risk to the negative and the unsatisfactory nature of the pictures produced by it. Copying in the camera has been used and is still used by many with various combinations of lenses—some with *one*, some with a *pair* of lenses; but, so far as I have seen, none of the cameras for the purpose are satisfactory or suited for the wants of amateurs.

I have now to introduce to your notice a little camera I have had made for the purpose, which answers in every way; and, although difficult to describe, it is easily understood when seen. The principle is to have the negative in front in an adapting frame to slide right and left; the distance is adjustable by two screws; the frame which holds the plate also slides right and left, and stops in two places with a drop catch, the lens (a short focussed double stereoscopic one) being in the middle. The camera is adjustable with screws for focussing, or for enlarging or reducing the image. The camera is then tilted towards the sky, the image is focussed, and the picture taken on wet collodion, moving the negative plate for each half of the picture; develop with iron, and, if requisite, deepen or tone with proto-iodide of mercury. One focussing and adjustment of the screws will be sufficient, and any number of negatives can be copied, if taken with the same camera, without any alteration. The negatives require no varnishing, so that all their original beauty is there to be copied, aud it is copied faithfully.

I might enlarge on the advantages this process possesses in copying negatives of different dimensions—how by regulating the light a thin negative will produce a dense print, or a dense negative a soft print; but those who are present will at once see this I will only call attention to the prints on the table, which I venture to say have never been surpassed. In doing so, I must say, that their quality is in a great measure owing to the exquisite beauty of the negatives, which were taken in India last year, by my friend Mr. Buxton, who has kindly entrusted me with them in their unvarnished state. I would call especial attention to some groups of elephants and natives on a tiger hunting expedition; instantaneous views on the Hooghley and at Singapore; to a grove of cocoa-nut trees; and to the far-famed "Alabama" coaling at Singapore.

Prints by this plan may be produced as fast as the plates can be prepared—much faster than on paper if a single negative be used, as the exposure varies from five to thirty seconds for each side; the very longest is but a minute of exposure, and the development and framing but a very short operation. Then, too, sheet or crown glass can be used, which at the present high price of plate glass is a great advantage. With ordinary care and clean glasses, there should not be one bad print in a day's work, as, after the first, the time of exposure can be accurctely fixed for each negative, and the desired tone obtained.

Trusting that this plan will induce amateurs to print their stereoscopic pictures on glass instead of paper, and professionals to lower the price of those they place in the market for sale, I have brought the subject before you this evening.

On Taking a Group.

BY H. J. MARIAN.

Before the holidays we called on friend B—— at his gallery, and found him quietly musing over his prospect of the good time coming, and concluded to spend a few moments in conversation with one so experienced in the art. While busily engaged discussing things in general, we were interrupted by a young gentleman who came to enquire what Mr. B—— would charge to take a group of young men, six in number.

The answer being satisfactory, he went out saying he would return again with the rest in a half hour. Everything in readiness, and having despatched one customer, we were again discussing matters, when the gentlemen came in and very soon were ready to take their position before the camera.

Mr. B—— prepared a plate, adjusted the camera, and told the gentlemen he was now ready, and would be pleased to have their kind attention for the few moments, and he would not keep them longer than necessary.

The spokesman of the party, who we will call Frank, replied that they wanted a good picture, and of course to get that it was necessary to obey the instructions of the operator.

The rest nodded assent, and so far it promised to be a very nice group, as they were arranged in very good taste.

As everything was now ready, Mr. B—— got the focus, put the plate in the box, and had just taken off the cap, when one of the party felt restless, and drawing one of his feet towards him, took the attention of all, and—that negative was useless.

Mr. B—— said nothing, but taking the negative out, laid it aside and prepared another plate.

Frank said that would have been a good picture if Bill had kept his feet still.

Being in readiness again, Mr. B—— thought he would make sure of Bill this time, and bringing out the head-rest, said—

"Let me fix your head in the rest."

"I would rather not; I can hold my head still."

"But, then, you are restless, and it will steady you."

(Bill thought not, but finally consented.)

"There, now gentlemen your attention again, if you please, and we will have a good picture. Frank, raise your chin a little, there that will do. Now, steady Bill."

The others remained like statues, cold and indifferent.

The camera adjusted again, and the eyes of all on the spots indicated by Mr. B——, the cap off, and watch in hand the seconds were timed.

To Bill it was a lifetime—his lips twitched, and his mouth puckered, though he bravely stood firm. But such a face!

"That will do," said B——.

"I am glad of it," says Bill, getting his mouth in shape and supposing all was right.

The plate being removed and washed, it was shown, B—— remarking it would have been an excellent one but for Bill's face.

Frank thought it very good, and wanted to know if Bill's physiog. could not be removed or left out in the printing.

B—— thought not, as it would spoil the effect. And to satisfy the party he would give another sitting. But this time gave them to understand that his politeness was worn out, and he would charge them for the picture whether good or not, but they might have their preference of the negatives.

One of the young men complained of Bill having spoiled the picture, and suggested that if he could be arranged to take a comical part it would not be noticed so much.

Another thought he might be left out altogether, but as the picture was for the club room the group would not be complete, and if they could not do better they would take negative No. 2.

Another plate in readiness, and the party arranged again, Mr. B—— went through the manipulations, and this time succeeded in getting a picture, but not as good as desired.

After removing the plate, fixing and washing, the negative was shown, and Mr. B—— desired to know from which negative he would print the desired compliment. Other customers being anxious to have a shadow caught, B——'s attention was taken from the party, and after some deliberation he was informed to have a half dozen each of negatives Nos. 2 and 3.

As they passed out of the room one of the party might be heard whistling—

"I'm not myself at all," etc.

We supposed it was Bill.

Simple Process of Carbon Printing.

BY M. MC A. GAUDIN.

The carbon printing process, practised for the first time by M. Fargier, occupies the first rank in photography for delicacy and permanence. It is this process that Mr. Swan has rendered more practical, and which has occupied so much attention in England. Silver printing upon enamelled paper is also as fine as carbon, and so is the uranium process, known by the name of Wothlytype, which recommends itself by a permanence nearly equal to that of carbon. But all these methods demand very complicated manipulation. To succeed by means of carbon requires that the luminous reaction should modify the vehicle, which seems to demand the employment of a certain darkness, and necessitates making the light to act at the back, through a film of transparent collodion; but certain considerations upon the mechanism of the luminous effect suggest a great simplification of the process.

If we take the daguerreotype, for example, we recognise that the sensitive film which produces its picture is of infinitessimal thinness, while by its hue it is nearly impermeable to light; and if we examine the proofs, by the microscope we recognise that they are exclusively formed by a *seed*, of insoluble particles, which by their multiplicity upon a given surface produces the intensity of the lights. Upon collodion and chlorided paper we observe the same phenomenon. The picture is always produced by the union of *juxtaposed*, and not by *superimposed*, centres of action; hence, if we want to prepare a sufficiently thin carbonaceous coating, there will result, by direct printing, a picture comparable to that furnished by silver plate, collodion, and chlorided paper.

I have always been instinctively of this opinion, but this last consideration confirms me in the idea. In operating *grosso modo* upon ordinary paper, by covering it with a brush dipped in bichromated gelatine colored with lampblack, which leaves very apparent streaks, I have attained a very satisfactory result; but by forming the film with all the skill imaginable we shall attain complete success.

To this end it will be necessary to apply the film to a perfectly uniform surface, unattackable by water; for example, upon strongly albumenized paper, glazed paper in the rolling-press before it is completely dry, and then to cover its surface by means of a soft leather stump, with an extremely thin film of bichromated gelatine colored with lampblack, washed with ether to remove the greasiness. In this case I maintain that the luminous effect will be translated, so to speak, in small circular radiating tufts, isolated from each other, invisible to the eye, distinguishable only by the aid of a powerful microscope, which produces the ordinary effect of photographic pictures.

Lampblack of the best quality unites very well of itself with a solution of gelatine, but for greater security it must be previously freed from the resin it always contains by shaking it up with ether, and then putting it on a filter. After drying it, it is mixed with the gelatine by a prolonged grinding, and at of arplying it, add to the paste thus obtained a suitable portion of a filtered saturated solution of bichromate.

The paper is dried spontaneously in the dark, after it has been submitted to the action of light behind a negative; it is then put into warm water, and in the course of a few minutes, by rubbing it with a camel-hair pencil as gently as possible, the image appears and after a prolonged washing in cold water it becomes fixed and imperishable.—*La Lumiere.*

A Bit of Experience.

BY M. S. ABBOTT.

To ALL that have trouble with dirty plates and the collodion peeling off! I take my plates (if new) and scrape their edges, then there is no danger of getting our hands cut; they are now ready for solution, two pounds potash to four gallons of water. Put them in one by one; let them remain about six to ten hours or even longer; it is immaterial if they are old varnished plates, all the same, it will come off like magic. On removing from the potash water, wash thoroughly with plenty of clean water. After this is done and the plate still wet, I pour over the plate (in the same manner as I do collodion) a solution of albumen, one ounce (or one egg) to two ounces of water, beaten thoronghly and filtered through clean cotton. First wet the cotton in your hand before placing it in the funnel; let it fit lightly at the first, and after the liquid has run through once or twice, then remove the cotton and wash it thoroughly in clean running water, and again place it in your funnel and press it into the neck, not too tight, but so as it will filter close. Hang the coated plate upon two nails or stand upon a clean sheet of paper, always placing the albumen side towards the wall with the greatest possible care in regard to dust, smoke, and bad chemical fumes, until it is dry, then it may be packed away; if good care is taken with coated plates they will keep clean any length of time. You will not only have a good clean plate, but one that will work quicker than by the ordinary way of cleaning.

I have used the process for years and find it the best and the cheapest, for one egg will cover twenty 8 × 10 plates, and two pounds of potash will last two months.

It only needs a trial and then you may lay aside your vice, rouge, whiting, rotton stone, alcohol, canton flannel, and one man's labor.

New York, Dec. 18th, 1864.

Editorial Department.

———Photography has flourished with reasonable vigor during the past year. The professional men find a satisfactory exhibit in their ledgers; the amateurs find their best pictures in the collection of 1864; the scientific men report progress and have laid out a great deal of work for the future.

Per contra, we have not had the fortune to chronicle any great discovery or invention. But editors must say something, and it is to be confessed that some of us talk very loud when the occasion is of the slightest; if there be nothing really new, the order is to re-discover, or to build up the facts drawn from imagination. In all the years that have passed since the birth of our art, we have no greater praisings and boastings than we have had in the year 1864, under the name of Magnesium Light, Swan's process and Wothlytype, or even the lesser affairs of Toovytype, and the Diamond Cameo.

In the United States humbug in our art seems to be losing its sway; a process pedlar during the past year has been a rare birn,—perhaps in the coming year we shall see the race extinguished. The reliable sources of information are discovered and generally recognised.

Upon the whole, we find what has transpired in 1864 to be fairly satisfactory; what we do not heartily approve we may dismiss with a laugh. But in the future we bespeak a better time.

To our subscribers, one and all, we present our thanks, and say a Happy New Year!

——Photographs on white or opal glass seem lately to be much talked about. Some persons suppose this style of picture to be entirely new, and that the process employed is quite different from anything commonly known. We are quite amused at the arrogant wisdom which some of those who have learned the art put on, and at the awe with which some of the outsiders speak of the matter.

The history of positives on white glass is substantially as follows. About five years since such pictures were first made for sale in England. They were praised by the journals, and for a short time were called for by the public. About three years since Mr. J. W. Black, of Boston, made them a branch of his business. He was eminently successful, and his success induced others to follow in the same direction. Mr. Alex. Hesler, of Chicago, and Mr. Thomas Faris of this city, may be named among those who at the present time in quality and quantity of the work are able to compete with Mr. Black. The art seems also to have reached our neighbors of Philadelphia, where under the title of "Toovytype" it has been invented by Mr. Wenderoth.

The only improvement which has been made in the picture, we believe, is due to Mr. Faris. This consists simply, as we have before recorded, in grinding the surface of the glass on which the picture is to bemade. Some of the pictures made by Mr. Faris are among the most charming specimens of photography we have ever seen.

The white glass photograph will command a considerable share of the patronage of the public; it has intrinsic merits; there is no kind of photograph yet made which so much pleases the eye. On the other hand, on account of the material used at present it is necessarily expensive; it is bulky and requires a frame or case. It cannot, therefore, become the picture for the million. Photographs have become a necessity, and the average number required for each enlightened human being would probably reach one hundred. There is evidently no place in our houses as now built tor so many cumbersome pictures. The carte cannot be superseded by anything more bulky or more costly.

In a future number we shaill probably go into the nice details of producing the pictures.

——We are greatly vexed to learn that the committee of the Photographical Society failed to secure the room on Broadway corner of Fourth street, recommended by them; they were anticipated by others who had made an earlier application for the premises. Moreover the committee have not succeeded in finding any other place which they consider suitable. The probability is that the next meeting will be held at the University. Due notice may be expected through the newspapers or otherwise.

Minor Correspondence.

J. F. B., of Mich.—"I see that one of your correspondents complains of his silver printing bath turning red, and does not like kaolin. If in six or eight ounces of solution he puts, say half a drachm of his fuming ammonia, and then sixty or eighty grains of nitrate of ammenia, it will keep always clear."

D. W. H., of Mich.—"I wish to know through the Journal, if in a photograph room over a furniture shop where they were using plenty of varnish, the silver bath would be injuriously affected by the varnish." ....Never have tried the experiment. Should suppose that varnish fumes and the silver bath are incompatible. Varnish fumes you recollect were death to the Daguerreotype.

M. H. P., of Mich.—"Can you inform me through the Journal or privately, the exact process of making pictures on opal glass I have pursued the same process as for making transparent stereoscopic views, and have not succeeded to my entire satisfaction. The pictures look too heavy." ....Your process is correct, and is all you need, except more careful judgment or manipulation. Your collodion may have worked too intense, or foggy, or you exposed too long. Put your thinking cap on and try again.

L. G., of Wis.—"Under the head 'Editorial Department,' you say salt throws down chloride of silver, but it has another property which prudent photographers must not forget. &c I wish in this connexion to learn if I can know just how much hydrochloric acid is necessary. Is there any way of knowing when the silver is all down? Is it a difficult matter to convert the chloride into metal? Is it possible for me to do it myself, if so, what will you charge to let me into the secret? It is done at Milwaukie." ....The silver is all precipitated when addition of hydrochloric acid does not produce any milkiness or turbidity; acid after that is a waste. ..The best way for a tyro to reduce chloride of silver to the metallic state, is to place a lump of zinc into a mass of chloride which lies under water slightly acidulated with sulphuric acid. The whole should be left to rest for several days, when all the silver will be found in the form of a grey powder. This powder after thorough washing should be melted.

C. DION sends us an order but gives no address. Where is he?

W. M., of Mo.—Inky tints are produced by rapid toning, a strong or hot bath. What tones are desirable is mainly a matter of taste A good rule for a photographer is to show what he can do, and let his customers make their choice; they pay the money.

C. J. B., of O.—"Inclosed you will find a small quantity of what I suppose are crystals of iodide of silver. I filtered it from my ambrotype bath after using nearly a week and then standing two or three days, the bath in the meantime producing good results, and still works well. Can you tell me what it is? It is darker than at first from being exposed to light without washing." ....The quantity sent is too small for convenient examination In our opinion the substance is acetate of silver. We will be much obliged to photographers who will send us specimens of matter obtained from the bath. The subject is by no means exhausted.

E. J. H., O.—"Please give me your opinion in the next Journal as to the risk of using gem apparatus without license from the so-called patentee. In forming ammonia-nitrate recently I obtained a white precipitate, on adding ammonia, instead of brown, as usual. What was the cause?" ....The Wing patent suit is not decided. The testimony is finished and it is now with the judges. We have seen too much of the uncertainty of law and lawyers to venture an opinion. The ammonia probably contained a carbonate or chloride If the precipitate was not readily re-dissolved, chloride was indicated.

J. M. B., of Mass.—"I have seen gold for toning in liquid state, said to have been reduced direct from the metal without the trouble of making dry chloride and dissolving. It was said to be economical, but I was asked five dollars for the secret and could n't see it." ....Dissolve the gold as usual; evaporate nearly to dryness; add water, and evaporate again. Finally, dissolve in water to get the strength you desire, remembering that one grain of gold makes two grains of chloride. The object of the evaporating is to get rid of the superfluous acid. For this information induce some of your neighbors to subscribe for the Journal.

W. A. S, of Pa.—"What is the specific gravity of the best ether, and also of alcohol? and should it be below the stondard strength, will quicklime answer to purify?" ....Ether sp. gr., 720: 95 per cent. Alcohol sp. gr, 816. Quicklime removes water from both.

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Printing on Opal Glass.

BY GEORGE F. WILLIAMS.

SOME attention is now being given to this subject, which, although somewhat old, is still very interesting, and is worthy of being better understood than it is at present.

It would be both unnecessary and operose for me to enter into the history of this branch of photographic printing; it is sufficient to say that at *one* time opal photographs were positively uncalled for. Since then, however, the photographic fashions, like all others, have undergone singular changes, and here in 1864 we find this subject absorbing a considerable share of attention.

In *The British Journal of Photography* of 25th November there is a very able leading article on the "Toovytype." and the whole process is lucidly explained in detail. In that article mention is made of some specimens on opal glass by Mr. Helsby, and I will now concisely explain the methods of producing them.

A negative is taken in the first place. There is then procured a long box, which is, in fact, the camera; one half slides within the other, and at one end a hole is cut, against which the negative is placed, and outside the negative is a piece of ground glass; this serves to diffuse the light before passing through the negative. A large gas flame is used as a source of light; and if a reflector be placed so as to throw all the light through the negative, the exposure will be so much shorter. At the other end of the camera is the dark slide containing the sensitive plate of opal glass : of this more hereafter. Midway between the plate and the negative is a wooden slide carrying the lens, which needs to be of such a focal length as will suit the box. Matters, then, stand thus :—The light from the gas (or daylight may be employed) is reflected through the ground glass and the negative; the lens then takes up the image and throws it upon the sensitive plate. If a *vignetted* print is required the vignette may be placed either between the negative and the lens or between the lens and the plate—the latter I think preferable; this, however, rests with the taste of the operator. The sensitive plate is the most important matter in the process. The glass employed has only recently been manufactured and is called "patent plate opal." The mode of its preparation is as follows :—The ordinary opal glass is taken, and the flashed or opal side is ground all over as is done with plate glass; this ensures perfect "flatness," and freedom from the "lumpy" condition mentioned in the editorial article referred to. This ground opal glass is then taken and polished by machinery, and the result is an article perhaps as beautiful as anything of the kind yet made. Photographers are mainly indebted to Mr. J. A. Forrest of Liverpool for its introduction. To bring it to perfection Mr. Forrest has expended much thought and labor, but his exertions have been crowned with complete success.

A piece of this glass is selected and coated as usual with collodion, the preference being given to one that works *clean*, even if not as quick as another sample. The plate is then sensitised in a forty-grain bath, and is ready for placing in the camera. The exposure varies with the light employed; it may range from a few seconds up to ten or fifteen minutes; but a few experiments will decide this point. The development is accomplished either with iron or pyrogallic acid, and must contain a sufficiency of restraining acid to keep the pictures clean, without, however, erring on the side of *harshness.* Much care is requisite in developing, for the opal is of so pure a nature that the slightest stain or deposit thrown down under the developer will inevitably show itself against the white surface beneath, and completely mar the effect. The plate is cleared of iodide in the usual manner.

Mr. Helsby has made the following method of mounting the subject of registration under letters patent. He uses a case similar to those employed when positives on glass were common, and an oval opening is made through the back of this case. He then takes a vignette glass made in either pale blue or rose-colored glass, and upon this he places the opal positive, and over the whole a covering glass, binding the edges of the three glasses with adhesive paper. The combined glasses are then pushed into the case, and on holding it up to the light is seen the vignetted portrait, shading off into a blue or rose-color; and in this consists the whole of the patent.

Another method is to mount the pictures without the tinted vignette, in which case they are positives by reflection. Mr. Helsby claims that the pictures with the tinted vignette for viewing by transmitted light, are also adapted fer viewing by reflection; but this, I think, is a mistake, for if we develope a picture far enough to have sufficient depth of tone for a transmitted positive, we find invariably that the deposit has commenced on the clear portions, thus obliterating the details of the image when seen by reflected light. Pictures mounted without the vignette are not amongst the claims of Mr. Helsby's patent.

Perhaps a better way than either of the above methods is to print a positive for reflected light on a piece of opal glass of an elliptical form. When this is developed and fixed, a covering glass of exactly the same size, and with the edges bevilled and polished, is taken, and with a drop of Canada balsam is cemented upon the positive with the aid of a little heat from a warm iron plate, in the manner that has over and over again been described in the *British Journal of Photography* for cementing achromatic lenses together. When the balsam has set, the photograph is placed in a case closely resembling a lady's bracelet-case, and it is then complete.

About eighteen months since, Messrs. Harvey, Reynolds, and Fowler, of Leeds, introduced into this country a process called "photodiaphanie." Paper is coated with a substance soluble in water—gum or gelatine, for instance—and when dry is coated with a thick film of albumen. The paper is then sensitised on a strong bath of nitrate of silver, and printed in the ordinary way under a negative till the shadows are deeply bronzed. The print is then removed, cut clear on the edges, washed, toned, and immersed in the hyposulphite of soda fixing bath. The albumen film now commences to blister all over, and when the print is fixed it is removed to clean water. The film now floats off the paper, and can be taken up, when it is put into several changes of water to free it from tho hyposulphite of soda. A piece of opal glass is then placed under the floating film in a large vessel of water, and very carefully raised out with the film lying upon it; and the superfluous water having been drained off the plate, it is then set up to dry. When dry, I found that the film contracted very much, and consequently separated from the glass. I tried acetic acid, as recommended, but without the slightest advantage, and ultimately I covered the plate with gum spread on with a brush and allowed to dry; when this is introduced under the film in the water the gum has just time to soften and thus to bind the film firmly to the glass. The film when dry is varnished like a negative, and is then capable of being roughly handled. The films can be applied to curved surfaces as well as flat ones. This process is very similar to the "Toovytype"—with this exception, that the picture is printed on paper, which allows of its being examined during the printing, and the film is *afterwards* transferred to glass. The prepared paper can be had from the firm named.—*Brit. Journ.*

On Fuming with Ammonia.

BY A. G. GRANT.

(Read before the South London Photographic Society Dec. 8th, 1864.)

PREPARE a solution of pure nitrate of silver, not less than sixty grains to the ounce. Common water is best, as it generally contains a small quantity of sodium, which assists in preventing the solution from discoloring. Pour the solution into a tray, and float the paper upon it for two minutes for *slightly* albumenized paper, and three to four for *very highly* albumenized paper. Should the paper remain in contact with the silver solution five minutes, it will do it no harm. Breathe upon the poper if it be inclined to curl up at the edges, when it will go down to a flat position. When it is ready to come off, lift the corner with a strip of glass, and hang up in a dark place to drain and dry. Papers are very conveniently ung on a line with either spring glass or American clips.

Very many modifications of the silver solution for albumen paper have been prescribed—among others, the admixture of nitrate of ammonia; or, what is equivalent, dissolving the precipitate formed by aqua ammonia with nitric acid. Ammoniacal salts of silver give a rich purple color to photographic prints, and hence it is highly desirable to secure the advantage of ammonia in the silver sensitizing of albumen paper. Instead of introducing nitrate of ammonia into the silver solution, it is better to form an ammonia-nitrate of silver on the surface of the paper by the fuming process, which will presently be described. Nitrate of ammonia in the solution will not economise silver, as has been claimed, by making a less degree of strength answer for prints of equal richness and beauty. Neither is there any advantage in employing it in conjunction with fuming. A silver solution for albumen paper will sometimes become discolored. The best method of decolorising is to filter it through animal charcoal.

Fuming Process with Ammonia.

When the silvered albumen paper is perfectly dry, place it in the fuming box, and expose to the fumes of strong ammonia contained in a glass dish in the bottom of the box, made air-tight by means of a plate-glass sliding cover, which can be opened and closed at pleasure from the outside of the fuming box, when it is filled with dry sensitized paper, ready to receive the fumes of ammonia.

The length of time necessary for fuming varies with different kinds of paper, from ten minutes to half an hour. A paper heavily glazed with albumen requires a longer exposure to the fumes than thin albumenized paper. A bad article of paper will sometimes turn brown over the ammonia vapor, and is therefore worthless for this process. In placing the paper in the fuming box, it must be fastened with the back of the paper to the lid, thus the albumen surface is exposed to the ammonia fumes.

The paper must never be put in the fuming box damp, for in that case a scum will form on the surface, which will spoil it for printing. The same effect takes place when the albumenized paper is excessively fumed. The paper should be exposed long enough in the fuming box to cause the prints to appear of a rich purple color while printing. If the paper appears red or chocolate-brown n the printing-frame, it has not remained long enough in the fuming box.

On removing the paper from the fuming box, it should be aired a few minutes, to allow the free ammonia to evaporate before placing in the printing-frame.

The advantages of ammonia are : that a weaker solution may be used to produce equally good results from the same quality of negatives, and in two-thirds the time; they are more easily toned, and less gold; they are less liable to become mealy in the toning; that greater sensitiveness is obtained, so that weaker negatives, with better detail, can be employed, and the prints produced appear more luminous and brilliant.

In hot weather the ammonia will be found to evaporate a drachm in about fifteen minutes. In very cold weather the bottom of the box should be warmed, so that the temperature in the box may be kept up to 60° or 65° while the paper is fuming.

My improved box is eight inches wide, two feet long, and two feet high, and will fume paper for 144 cards at once, with a swing handle at each end, a knob on each lid, with a lock and key; it is light, neat, and strongly made of thoroughly seasoned wood, and polished.

Printing the Fumed Paper.

A negative which is over-exposed will produce the best results printed in diffused light. A negative which is under-exposed and over-developed or intensified produces the best results printed in the blazing sunlight. As a rule, it may be concluded that this operation is complete when either the lights have become slightly tinged by reduction, or when bronzing begins to appear in the shadows. Now remove the print from the frame, taking care not to expose it to strong light, or the whites will be injured. Wash the prints thoroughly, so as to remove all free ammonia-nitrate of silver, which requires about fifteen minutes, and at least two changes of water.

The washed prints may now be toned by any common formula. But to those who may desire it, I will give a few formulas for toning, which I know to work well.

Formula No. 1.

Chloride of gold	1 grain.
Distilled water	8 ounces.
Carbonate of soda to neutralise the acidity.	
Alcohol (pure)	2 drachms.

Formula No. 2.

Chloride of gold (common)	2 grains.
Distilled water	8 ounces.
Phosphate, citrate, or acetate of soda	100 grains.
Chalk to neutralise the acidity.	

Formula No. 3.

Chloride of gold (pure)	2 grains.	
Distilled water	4 ounces.	
Chalk to neutralise the acidity.		
Phosphate of soda	2 grains.	
Acetate of soda	2 grains.	
Nitrate of uranium	2 grains.	Filter the latter and mix.
Distilled water	4 ounces.	
Chalk to neutralise the acidity.		

To neutralise acid solution, throw in a leaf of blue litmus paper, which turns red; then add chalk or carbonate of soda (I prefer the former) until the blue color is restored.

Fixing Solution.

Hyposulphite of soda	2 ounces.
Water	12 ounces.
Alcohol	4 drachms.

The first effect of this bath is to turn the prints a red hue, and then finally black again. Move the prints about in this bath constantly, and keep them in until the whites are perfectly clear when viewed by transmitted light, and the tone has been restored. Now take one by one as fast as the fixing is completed, and remove all traces of hypo. They are then ready for drying in the usual manner.

Producing a Non-Actinic Color in Negatives.

Attention has recently been called in France to the importance of procuring a non-actinic color in the dense ports of negatives. M. Cassan, in a recent communication to the French Society, insists upon the importance of this condition, and states that he has discovered a method, which he does not at present divulge, of converting the grey deposit into red, yellow, or green, rendering it non-actinic without increasing its thickness or rendering the negative hard. Such a method would possess the greatest possible value to the photographer. What photographer is there who has not examined with a technical delight the exquisitely-delicate gradations of a good iron negative before it has been intensified, and has not regretted the frequent loss of some of that delicacy and crisp detail, after it has been made sufficiently intense for printing, by piling up silver upon it? M. Cassan professes to have discovered a method of imparting the necessary printing intensity without increasing the deposit. From the discussion on the subject, it will be seen that the only suggestion as to the means employed made at the Society, pointed to the possibility of using a colored varnish, which M. Cassan says, would defeat the object, as the shadows and lights generally would be rendered yellow and non-actinic.

M. Piard has since communicated to the *Moniteur de la Photographie* the results of some attempts to produce colored negatives, by means of salts of mercury and iodine. But in these applications there is nothing new to photographers in this country, who are for the most part familiar with the various tints of yellow and green which may be thus produced. In these, moreover, there is additional deposit added to the picture, and a form of deposit which, except in skilled and careful hands, is very likely to produce hardness.

M, Piard, in a subsequent communication to the same journal, suggests, as an improved mode of applying the mercury and iodine, their use in the form of vapor. This will be found identical with the method we employed nearly four years ago, and described in the *News* of April, 1861.

It is tolerably clear that, if the method of M. Cassan have the advantages it claims, it must be effected by other agents than mercury and iodine. Neither can it be satisfactorily effected by means of a colored varnish, as suggested by M. Humbert de Molard; the reasons urged by M. Cassan being tolerably conclusive against such a method.

What method can be employed, then, to give a sufficiently non-actinic color to the lights of a thin picture, without coloring or injuring the transparency of the shadows? The subject is worth the attention of experimental photographers. The application of a solution of the iodine will convert the grey deposit into an olive tint, or yellow, according to the amount of actien it is suffered to exercise. But in this case something, however little, is added to the depost; and the film is, moreover, apt to be in some cases acted upon by light. The application of dye of some kind, which may saturate the more or less porous deposit on the lights, and be readily washed away from the film in the parts where there is no deposit, constituting the shadows, might possibly answer; but the dye must be one which is not bleached by the action of light. We have made a few experiments upon varnished and unvarnished negatives, using Judson's dyes, both yellow and red. To some of the unvarnished negatives to which the color was applied, the color remoined to some extent in the lights, and was quite removed, by washing, from the shadows. The color was best seen in such cases by examining the back of the negative. The dyes when applied to a varnished negative, colored it deeply without difficulty; but the shadows were colored as well as the lights, although in a less degree. We have had no weather in London which hus permitted of comparative printing experiments, so that we cannot speak of the practical value of the color conferred.

The subject is, however, an interesting and important one, and worthy of the attention of the ingenious and experimental photo grapher.—*Photo. News.*

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BROMIDES OF MERCURY.—The *proto-bromide* is a white insoluble powder, obtained by precipitating a solution of proto-nitrate of mercury by bromide of potassium. The *bibromide* is formed by dissolving peroxide of mercury in hydrobromic acid.

How to Recover Silver and Gold.

BY W. H. SHERMAN.

The following is a very simple method of saving the silver from the washings after development, and the gold from waste toning baths.

Let the developing room be provided with two sinks of equal dimensions, each of suitable size for the largest plate used in the gallery, and six or seven inches in depth, one being placed above with its bottom on a level with the top of the other. One end of the upper one may rest on the adjacent end of the lower one, thus representing the form of two broad steps.

Insert through an orifice about an inch from the top of the upper sink, a piece of half-inch india rubber pipe, fifteen inches in length, bending down the end *inside* the sink to within an inch of the bottom, and letting the end *outside* hang down over the lower sink. The part of this outside should be longer and reach lower than the part inside, thereby forming a syphon, and the orifice through which the pipe passes should be tightly closed with melted gutta percha or wax.

Now having a water cock over each sink, and a waste-pipe from the lower one, let the impressions be developed and the silver rinsed off from both sides of the plate, into the upper sink with as little water as will just answer the purpose, leaving the thorough rinsings to be done in the lower sink. The film of rejected negatives may be washed off, and the waste toning baths may also be emptied into the upper sink. The iron of the developing solution continually added to this sink will precipitate the silver, and, moreover, with the aid of the acetic acid, and perhaps the alcohol, effectually precipitate the gold from the waste toning baths.

Whenever this sink becomes filled to the top of the syphon, the water which it contains will very quietly flow out of its own accord, leaving the sediment behind, undisturbed, on the bottom of the sink, where it may remain until it has accumulated so as nearly to reach the end of the syphon, when it may be removed to a jar kept for the purpose.

It may be unnecessary to add that washings from the cyanide and hyposulphite baths should be kept out of this sink, as they would only redissolve some of the precipitated silver and gold.

I have used this contrivance for more than a year, and have been so well pleased with the proceeds thereof, that I am sure such of your readers as may have occasion to use it, will thank you for publishing this description. Those who have not heretofore saved the wastes above referred to, will, by trying the experiment of saving them, be surprised at the amount they have been throwing away.

MILWAUKEE, Wis., Dec. 26, 1864.

Photography upon Painter's Canvas.

BY A. LIEBERT.

MR. WALDACK's process for taking enlarged positives on artist's canvas, requires the employment of *iodide* of silver, the manipulation with which, as in iodized positive paper. is very troublesome. I can understand that recourse would be had to preparations of this nature, in spite of the difficulties and chances of failure encountered at every step, when for enlarging photographic pictures there were at hand only instruments necessitating a very long experience; now that enlarging apparatus is much better constructed, we are able to obtain pictures upon albumen-chlorided paper very rapidly, and consequently this branch of photography is every day developed. It may, perhaps, not be uninteresting to your readers to learn of an easy process for obtaining enlarged positive pictures upon canvas by means of *chloride of silver*, which renders the process as simple as that daily employed in printing with the pressure-frame. This process which I employed advantageously in America, during six years, is described in my forthcoming treatise on practical photography, from which the following account is extracted :—

The canvas, primed with white lead, is well strained upon it frame, and first washed with strong alcohol, which is applied all over with a soft brush for several minutes; it is then left to dry in the *shade* ; it is afterwards gone over with a soft brush dipped in the following solution :—

Water	50 parts.
Bicarbonate of soda	5 "

until the canvas assumes a uniform white tint; it is then placed in a sloping position, and washed with water poured from the rose of a watering-pot, and then left to dry in the shade. Thus prepared, the canvas will be ready to receive the solution of salt and nitrate of silver, as with positive paper.

The salting solution is composed of—

Water	500 parts.
Hydrochlorate of ammmonia, in powder,	10 "
White gelatine	1 part.

The gelatine must be of the best quality. It is first dissolved in a mall quantity of warm water, then added to the solution of salt, which must also be slightly warmed, especially in winter.

In many cases we may employ the solution of salt without the addition of organic matters, which are added only to form a vehicle capable of producing more relief and sharpness, with which we can dispense, as the canvas is soon covered with paint, and it is only the sketch that we require.

This bath will be applied like the preceding solutions, with a soft pencil, taking good care to produce a uniform coating, so that an equal impression of the pictures be obtained.

When the salt coating is dry, the sensitizing will be performed in a dark room, as with paper simply salted, with a solution of ammonio-nitrate of silver, also applied with a soft pencil, or with a tuft of cotton reserved especially for this purpose. The canvas is then exposed in the solar camera, as in taking a picture on paper, and the printing is stopped when the picture has nearly attained the tone it should have when finished. It must be immediately fixed by covering the surface of the canvas with the following solution —

Hyposulphite of soda	5 ounces.
Water	50 "

This solution is poured freely over the surface of the canvas, so as to cover it completely and equally, then repeated, and afterwards the canvas is well washed under the tap; after which it is covered by a solution of—

Water	½ pint.
Sulphuric acid	30 drops.

With this solution, two minutes application will suffice; the picture is then washed in abundance of water, and dried; in this state it will be ready to be painted. If the picture has not all the sharpness and relief of proofs taken on paper, it is at least distinct enough to enable the painter to avoid much of the uncertainty that a doubtful sketch frequently entails.—*Moniteur.*

Some Remarks on Focussing.

BY M. CAREY LEA.

At the present day, when the number of photographers who are really well versed in most of the practical details of negative making, is so large, there is perhaps no point on which there is a wider difference of skill perceptible than in the focussing. Some persons appear to be naturally incapable of judging of a focus, and I remember the case of a photographer who did not hesitate to declare in print in the columns of an English journal that he "could rack his camera out and in, half an inch, without disturbing the focus"!

But apart from such exceptional cases as that just mentioned, every one with keen vision is aware that there is a vast amount of bad focussing done, especially in "copying." There is at present a great taste for small reproductions of the card size; vast amounts of these are sold. I have noticed at one of the establishments that they had over a thousand subjects kept in quantities, and quite likely, others may have yet more. Not one in twenty of these is worth having, and perhaps one in fifty is really good. The first conspicuous fault is bad foccussing. Next to that, underexposure and over-development with its usual result of chalky lights and patchy blacks.

With landscapes the fault is less apparent, especially as one part may be brought into focus by the very failure to focus that other part upon which the operator's attention was actually concentrated. It is really remarkable however, how little attention the general public gives to landscapes compared with reproductions—possibly because the number of really good professional landscape photographers is so very limited.

I hold that no man who wishes to focus thoroughly well, and at the same time respects the preservation of his eye-sight, will neglect to use a microscope, and concerning the use of the microscope, I design to offer a few brief remarks.

In the first place, ground glass is worthless for focussing upon. It is true that the ground glass which is employed by some of the best opticians in England in their very best work is much better than any that can be got here, still even that is not what is wanted.

Some ingenious and intelligent photographers (if I mistake not, Prof Emerson was the first) have proposed to use a piece of plain plate glass, and to use a double eye-piece for examining the image. But as this eye-piece is capable of taking an image formed in space, and transmitting it magnified to the eye, it was evidently possible that when a sharp image was transmitted to the eye by the eye-piece, the actual position of that image might not correspond with the anterior surface of the focussing plate, but might be before or behind it. This difficulty it was proposed to remedy by previously adjusting once for all (for any given focussing plate) the distance between the lenses of the eye-piece that when it was applied close to the posterior surface of the focussing plate, a scratch on the anterior surface would be exactly in focus. Then, it was urged, when the eye-piece is thus adjusted, and the image viewed by it appears perfectly sharp, the position of that image must correspond with the anterior surface of the focussing plate.

This reasoning had sufficient appearance of cogency to lead many persons to adopt the method; compound eye-pieces have been constructed for this purpose, and if such eye-pieces had an exact, easily found focus, the system would be good. But they have not. One which I especially examined had a depth of focus of a full tenth of an inch. That is, when the focus had been determined as exactly as possible, the object could be moved backwards and forwards a twentieth of an inch, and still appear in excellent focus. Necessarily, the same thing held good for the camera image. Its true focus might be a twentieth of an inch before or behind the anterior surface of the glass plate, and yet it would appear correct to the eye when viewed through this eye-piece, which in fact, possesses the power of compensating errors in the position of the camera image, to the extent just mentioned.

The idea is, in itself, excellent, and if it were not for the fatal defect just mentioned, it would be by far the easiest, best and pleasantest method of determining the focus. Much more light reaches the eye, and the image seen is far more brilliant and distinct than any that can be obtained on ground, or otherwise prepared glass. But in this system of focussing we are never certain that the image which we see, is that which the sensitive plate is to receive.

If we cannot (and such I think is the case) adopt this system of operations, it becomes of interest to know in what way we may best obtain a sharp focus. The ground glass put into the best instruments in this country is very bad, and very little detail is visible upon it. By long habit, an intelligent operator manages to do good work, but always hoping to find a great amount of detail in his negative that he cannot possibly see upon the ground glass. It is true that no plate that can be made, will enable the operator to see everything upon it, but a great deal can be accomplished in this direction, and I propose here to give the result of a very large number of actual experiments which I have lately made.

It is an old suggestion, to sensitise a collodion plate, wash it, and use it to focus upon. But such a plate has various defects, and will, I think, be rejected without hesitation. In a focussing plate we want the finest possible texture—this the sensitized plate has, but we want also a certain opacity and density, which the silver plate has not. All those rays from the lens which pass directly through the film, are entirely lost to the eyes. *Through* the film we see the imge formed *on* the film, and the film must have sufficient strength to receive a bright image. As a general thing we may lay down this canon: that any film through which we can see the aperture in the lens as a tolerably well-defined circle, of its real size, is too transparent. And this is the case with a sensitised collodion film. Again, some samples of old, and even of new, collodion, give an opaque film, dry "dead," as it is called. These plates may sometimes be made beautifully fine and regular in appearance, but they are open to the same objections as the former

—they are too transparent. They are however free from the very great fault that belongs to the sensitised collodion, which though bluish by reflected, is yellowish brown by transmitted light, and as the color is very trying to the eyes the fatigue of focussing is thereby materially increased.

My next experiment was to dissolve chloride of copper in collodion, and plunge the glass into a bath of oxalic acid. The oxalate of copper is of a very pale blue, nearly white, and would, I thought, give an exceedingly pleasant film to work with. But it proved also too transparent and what considerably surprised me, it too was yellowish-brown by transmitted light.

My next trial was to expose a plate in the vapor of hydrofluoric acid, and thereby etch it. The result was better than with mechanically ground glass, but still was not sufficiently fine.

Varnishes were allowed to dry "dead," but the grain which was obtained in this way was very unsatisfactory. Such plates are not in the least to be recommended.

The first thoroughly good plate which I obtained was got as follows :—Make a weak solution of sulphate of ammonia (or soda) —a few grains to the ounce—and dissolve in this solution gelatine to about the proportion of twenty-five or thirty grains to the ounce, When a clear liquid is obtained, add a little solution of chloride of barium, stirring all the while. An exceedingly fine precipitate of sulphate of baryta forms, which remains suspended in the gelatinous liquid. Pour this on the glass in the same way as collodion and without tilting it to let it run off. Leave a considerable quantity on, for this mixture increases greatly in transparency on drying. When dry a beautiful plate is obtained. Perhaps a clearer idea of what I mean by a good plate can be found by mentioning some instances which will enable those who think ground glass good enough to judge of the advantage thus gained. The following will show what I mean.

I have focussed a three-story house at such distance, and with so small a lens that its size upon the focussing plate was three-quarters of an inch in height, using the smallest stop but one of three-inch, Harrison globe lens, which lets in but little light. I was able with a single microscope to clearly distinguish the white lines between the bricks, upon the focussing plate. No ground glass which I have ever seen, would afford anything like such detail as this:—

although a clever focusser might perhaps have focussed on a lens with ground glass well enough to have made these lines visible on his negative. Still, it requires no argument I think to show that the result must be better, and the trouble less, with a good plate than with a bad one.

I was not however willing to be content with the baryta plate until I should have satisfied myself that nothing better could be found. I continued my trials and have found a plan which absolutely leaves nothing to be desired. The fineness of its texture is perfect—it is easily made, and needs no protection. It is simply STARCH. Fine thin well boiled starch is strained through muslin to remove lumps, and is then poured over the plate. It will not be required to be poured off, but should be left on the glass to the thickness of about a tenth of an inch, which quantity will leave only a thin film on drying. It is then to be set aside in a place free from dust, and left to dry spontaneously. It must not be placed in a drawer, as the drying may then go on so slowly that the starch will turn sour and drain off the plate before drying. The glass plate must be thoroughly clean and free from grease, for the adhesion of the starch on drying is not very strong, and a good many plates are spoiled by detaching on drying. But when dry, the adhesion is strong, and the film is hard and not easily injured by scratching, It should not be varnished, for its grain is so fine that all opacity disappears by the effect of the varnish, and the plate becomes as clear as clean glass.

I believe that the utility of starch, and the great beauty of the plate which it affords, has never before been pointed out. Better resxlts for definition even than those above-mentioned, can be obtained. The facility of obtaining it everywhere is another advantage. Mr. Moran, the landscape photographer, lately mentioned to me that while taking views last summer in the White Mountains, his focussing glass was broken. It could not be replaced, and he found himself obliged to focus on a fragment which remained attached to the frame, and to guess at what was to be included in his view. But although ground glass is not everywhere to had, starch is, and no one need be at a loss how to replace his ground glass with something much better.

Before closing the subject of focussing in general, I propose to say a few words on the subject of *focussing slides*. It is in my opinion a great mistake to fix the ground glass or other surface *permanently* in the slides. I much prefer a construction which I have adopted in a camera lately made for me by Mr. Peace of this city. The frame has but a single rabbit, that in front of the plate. On the side of the frame furthest from the lens, are two springs, long and curved. These may be pushed around until the points touch the glass, and hold it firmly in its place. This construction has many advantages; one is, that it admits of changing the focussing surface, and experimenting upon different surfaces, with great convenience. Besides, if the operater sometimes uses plate glass and sometimes the more ordinary glass, which has curves in it, he cannot expect good results if he focusses always on the same focussing surface. If he focusses on ground glass which has usually a plane surface, and then takes a picture on window glass, or other curved glass, how can he expect to do first rate work? If his lens has a very long focus, perhaps he would make out well, but if he has a short focus lens, he is *certainly not taking the picture which he saw on the ground glass.* That much is clear.

I say then without any hesitation, that every negative ought to be focussed on glass similar to that on which the image is to be eventually formed. If working on curved glass, and taking the picture on the concave side, as is generally done, the focussing glass should be a similar piece of glass, of average curvature, and having a focussing film applied to its concave side. So, too, similarly for other sorts. And again, as ground glass has usually, if not always, a plane surface, it can never be suitable for focussing a picture to be made on curved glass.

I presume that this is the reason why very many operators find that they can only do their very best work on plate glass, because there is then a real coincidence between the positions of the two glasses.

The construction of focussing slides just spoken of, has other advantages besides what I have here adverted to, but as they are foreign to ths subject of these remarks, I shall not discuss them at present.

PHILADELPHIA, Pa., Jan 2nd, 1865.

——Alcohol good enough for collodion, now costs over five dollars per gallon.

The Natural Colors.

Has there been any recent discovery made with natural colors? and if so, by whom? and can you tell me anything about the process and prospects of final success?

Last Spring, I made some discoveries in that direction; and about two weeks since I prepared a strip of paper, and then tore it into three pieces; I placed one under a red glass, another under blue, and the other under yellow. In a few minutes I looked at them (after placing out in a good light) and each piece had taken the color of the light to which it was exposed. The red and blue were nearly as deeply colored as a ribbon, the yellow was not so perfect, which can be accounted for by that part of the paper being not so well prepared.

I give you the result of the above experiment as a reason for asking the questions that I did, and with the hope that you would give me any information that you might have that would benefit me in my experiments.

I have made some efforts to make the process applicable in the camera, and with prospects of success. I am however not able to work at it much.

A. Paage.

Bowling Green, Ky., Dec 26, 1864,

[We know of but one notable discovery in the direction of natural colors, viz., that by E. Becquerel, of Paris, about twenty years since. You appear to have something new. Let us hear about it. We have no expectation that in our day the problem will be fairly solved; but everything concerning it ts of interest to everybody.—Ed.

A Curious Freak of a Negative Bath.

I had a negative bath of about sixty-five ounces in bulk, and forty-five grains strength, very slightly acid with acetic acid. It was in good working order until, without any apparent reason, it commenced taking up the bromo-iodide from the plates, and continued to get worse and worse until I could no longer work it. I then evaporated it, when I found so much iodide of silver in it, that it was almost the color of nitrate of uranium. I then redissolved it, and filtered, without adding anything to it, and had an excellent bath.

J. P. Wilson

Olney, Ill., Dec. 28, 1864.

On the Tannin Process.

BY JABEZ HUGHES.

[Read at a meeting of the London Photographic Society, Dec. 6, 1864]

The tannin process was first described about three years since, in the sixth edition of Hardwich's Photographic Chemistry. Its merits were quickly discovered, and it soon came into general use. The author, Major Russell, has been most untiring in his exertions to perfect it; and in his book on the subject, as well as in his numerous contributions to the photographic journals, he has labored hard to remove the difficulties to its successful practice. The result is that the process has gradually displaced most others, and at the present time it may be considered the most popular method of producing dry plates. Like every process that has had general recognition, there has been a desire to improve it; hence a variety of modifications, alterations, additions, and variations of the original formula. These have often consisted in adding some other substance to the tannin, to improve its original goodness. With this view, honey, malt, glycerine, albumen, gum, sugar, gallic acid, pyrogallic acid, and many other substances have been proposed. Without calling in qnestion the propriety of these additions, I propose to invite your attention to the merits of the original process in its primitive simplicity,

The process has pleased me very much by its simplicity and certainty; it has also another recommendation—namely, that except the solutions of tannin and carbonate of ammonia (both of which are easily made, and will keep any time), there are no chemicals required but such as are necessary for the ordinary wet collodion. There is no getting a lot of unusual things about you just when you want to prepare your plates, no beating up of white of egg, no dissolving of gelatine, no sending out for this or that which you may not obtain; the ordinary materials indispensable for amateur or professional work can at once be used without preparation.

The collodion I have employed has been such as is fitted for ordinary negative portraits; that made by myself, containing four grains of an iodide to one of bromide, has answered well. I have also used Mawson's, both alone and mixed with my own, with equally good effect. I think any good commercial bromo-iodized collodion will answer, provided it works well in the wet process and gives a dense creamy film. I confess to a partiality for creamy films; in the wet as well as the dry process, I think they are exempt from many of the evils to which more transparent films are prone. I am aware that,in expressing my approval of a collodion containing a much larger proportion of iodide than bromide, I am at variance with those advanced workers in tannin, Major Russell, the late and esteemed Mr. Glover, and Mr. Sayce; but I know these gentlemen will exonerate me when I say that I do not urge my mode of working as being better than theirs, but I am only narrating my own experience. I am quite open to correction, and desirous of information. As yet I have not experimentally compared the results of an almost exclusively bromized collodion, such as these gentlemen use, with the usual bromo-iodized one employed by myself. I hope to have that pleasure, when, if I am convinced of its superiority, I will willingly abandon my present practice; but, in passing, I must confess that I am not prepossessed in its favor by my few attempts with an exclusively bromized collodion.

I have not found it necessary to use any coating of gelatine or india-rubber to my plates before collodionizing, as the films have remained intact during all the necessary washings. I simply coat my plate in the usual manner, using a pneumatic holder, and allowing the collodion to flow to all the corners; when the film is set, the plate is immersed in the usual thirty or thirty-five grain nitrate of silver bath, such as is prepared for taking portrait negatives. The bath is faintly acid. I have prepared plates in a bath containing as much as one drop of strong nitric acid to each ounce of solution; and, though I did not gain the advantage I sought in the experiment, I am not aware that the plates prepared in the bath were any the worse for the extra quantity of acid: from this I conclude that a considerable quantity of acid may be present in the bath without being prejudicial to the dry plate.

The plate is allowed to remain the usual time in the bath; when sensitized, and all apparent greasiness removed, it is taken and immersed in a dipping-bath of distilled water. In this it is allowed to remain until another plate is sensitized, then washed for about sixty seconds under the tap, next flowed over with a fifteen grain solution of tannin, and in this state set aside to dry.

These operations, thus easily described, are almost as easily performed; yet a few words in explanation will be in place. If, instead of putting the plate in distilled water when it comes from the bath, it be washed directly under the tap, it will certainly not turn out satisfactory, as there will be an irregular formation of chloride and carbonate of silver in and on the film. Immersion in a dish of common water will not be much better; but by first soaking the plate in distilled water, the greater part of the nitrate of silver is dissolved out, and the remaining washing can be done by common water. It is well to change the distilled water from time to time; how often, depends on the size and number of the plates, as well as on the quantity of distilled water employed. In sensitizing my usual size plates, 10 × 10, I change the water, about eighty ounces, for every six plates.

I have said, wash the plates for sixty seconds under the tap after coming from the distilled water. You may say, Why sixty seconds only? and why not longer?

Well, I do not find any advantage in prolonged or excessive washing, but often a disadvantage; it is sufficient if the plate is washed enough. If the plate is insufficiently washed, when the tannin solution is poured on, the film will turn brown. The first place where this *browning* takes place is at the thickened edge of the film, where the collodion was poured off. This is the place to look to judge of the sufficiency of the washing; if this portion of the film keeps its pure color, it is washed enough; if it turns brown, more washing is necessary, and very probably the distilled water requires changing. If this browning is confined to the thickened film on the edge, the plate may be safely used; but not so if the color has extended over the film.

The evil tendency of overwashing is to produce fog. This is a statement for which one is scarcely prepared. That deficiency of washing should produce fog seems feasible; but that excess of washing should cause it appears very singular. Yet sufficient testimony of independent workers has accumulated for us to consider this point settled, that is so long as a collodion is used containing a bromide. Major Russell has given an ingenious, and, I believe correct, explanation of this circumstance, and those who are specially interested I refer to the Major's recently published articles on the subject; but, as the discussion of it can be dispensed with on this occasion, I pass on with the recommendation not to wash the plates longer than is necessary to to prevent browning of the film on application of the tannin.

I have named a fifteen-grain solution of tannin; it is probable that other degrees of strength may at times be desirable; but having succeeded so well with this strength, I have thought it good to adhere to it. I have found samples of tannin differ, not only in solubility, but in other qualities. I therefore suggest, when things do not work well, to try a different sample of tannin. It is important that the tannin solution should soak well into the film, so that all parts are equally imbued with it; unless this is done, there will be marks and stains in the negative. I have generally held the plate with a pneumatic holder, and poured on the solution, allowing the first portion to flow off, carrying with it the surface water; a second portion has then been poured on, which I have allowed to flow backwards and forwards, until I have thought it incorporated with the film. More recently I have adopted the plan of immersing the plate in a dish containing the solution of tannin, and allowing it to remain soaking until the next plate was ready. By this means all risk of stains and draining marks are avoided, I intend trying a dipping-bath, as being a very convenient mode of immersing; and I think the tannin solution may be used indefinitely by occasionally strengthening and filtering it.

(Concluded in next Number.)

Editorial Department.

——Through the politeness of Messrs. E. & H. T. Anthony, we have had the pleasure of examining a genuine Wothlytype, fresh from the hands of the inventor. We found the picture, as we expected, gold. The proprietor of a process on sale would, of course, send a creditable specimen. On a hasty view, the picture would be considered a print made in the ordinary way; it would not be singled out of a collection of first-class photographs as anything peculiar or remarkable. Most persons would pass it by simply as a fine photograph of a handsome lady, taken in a graceful attitude with artistic surroundings. On closer inspection, the collodion film will be recognized, with its slight differences from the ordinary albumen film; whether these differences are an advantage or not, we are not prepared to say. If pictures like the specimen could be produced at a less expense of time, labor, trouble, and cost of material, we should expect to see the Wothlytype made common. But as the matter stands, knowing the process, we have little hope of ever seeing another Wothlytype. Some other more hopeful than we may improve the opportunity of purchasing the patent for the United States for 25,000 francs; such a chance is now open.

—— Mr. G. D. Wakely, formerly of this city, has recently returned from the gold regions of Colorado, and has brought a fine collection of views. Many of the views are illustrative of gold mining, and of special interest to the shareholders in mining companies; but some of them simply as landscapes are the most pleasing photographs we have ever seen. The views of the "Twin Lakes," and the "Garden of the Gods," are among the most charming natural scenes in the world.

——Mr. S. A. Holmes, who is exclusively devoted to landscape photography, has been out among the oil wells of Pennsylvania. The result of his trip is a complete panorama of the oil interest there. We have read a great deal about oil, but a half-hour's study of Mr Holmes' pictures taught us more than we ever knew or expected to know about the exact way in which the business is carried on. We advise all those who have "oil on the brain," to get some of these photographs. See Mr. Holmes' advertisement.

Minor Correspondence.

A. M., of Pa.—"I am having a new suite of rooms fitted up for a photograph gallery and expect to have a large reservoir to catch the water from the entire building. The reservoir will hold about 30,000 gallons, and as it will be necessary to have it lined with some kind of material, I thought I would take the liberty of asking you to inform me through the Journal what I had better line the reservoir with, so that the water will be suitable for all photographic purposes." ....Sheet lead will make the best lining to prevent leakage. But why line it at all. If the tank is well made of good lumber, there will be no danger of leaking. It is not customary to line wooden tanks with anything, unless they are intended to contain corrosive liquids.

J. C. S. of Ill.—"A dispute arose between myself and three other operators, on three different questions, as follows: 1. Is there any advantage in fusing nitrate of silver for the negative bath? 2. Is there any advantage or economy in using nitrate of uranium in the toning of albumen prints? 3. Should there be any ammonia used in the silver solution for albumen paper or not? After a long talk we agreed that yourself, or Mr. Divine, should decide the question, and give the advantage or disadvantage of either or all; the questions are of little importance, but as the one that the decision is against is to present the other the Journal for one year, this may interest you enough to give them attention." .... 1st. Nitrate of silver is always fused *before* crystalization, by manufacturers who understand their business. Fusion *after* crystalization is useless. 2nd. In our opinion none whatever. 3d. Yes. The ammonia assists in preventing the solution from turning red. ..We are not of a betting character, but will assist in the decision of any photographic wagers which shall result in the greater usefulness of this Journal. We have been unable to see Mr. Divine; we think he will indorse our decision. Send on the subscriptions.

S. N. R., of Conn.—The transfer paper for the opal pictures seems not to be a success. The plan, however, seems plausible, and we expect that some one will find a practical way of carrying it out.

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On the Tannin Process.

BY JABEZ HUGHES.

[Read at a meeting of the London Photographic Society, Dec. 6, 1864.]

(Concluded from page 335.*)*

I have tried washing off the tannin before drying the plate, but have not been so well satisfied with the nature of the image. I have therefore returned to the original instructions of allowing the tannin to dry on the plate.

I have not used artificial means, for drying. The plates are prepared in my dark room, in the evening, and, resting on folds of blotting-paper, either in the rack or against the wall, remain unmolested till the morning, when they are found to be dry. The edges are then varnished, about an eighth of an inch all round, with the common asphalt black varnish used for glass positives, which answers remarkably well.

The plate is now ready for exposure; and to the natural question that may now arise, "How long will it keep?" I can only give the innocent answer, "I don't know."

I have ordinarily used the plates soon after being prepared, say within a week or ten days; and the longest time I have kept them has been about six weeks; to that time they were quite perfect, and I know no reason why they should not keep much longer.

I have no doubt that zinc or mahogany is the best to keep them in; but I have used only the regular deal plate-boxes, and I am not aware that I have suffered by the practice.

With respect to the time required for exposure in the camera, I am sorry I cannot say, as some have done, "Give the same as for wet plates." I have tried them many times against wet collodion, and with alkaline development they have required twice the. exposure of the wet plates developed with iron; if developed with acid pyro, they required six times the amount of exposure. I always have in view the kind of development I intend to use when I expose; and I like to give as I can to each subject, knowing that, while over-exposure may be modified, there is no remedy for under-exposure. When the conditions permit, I prefer to continne the exposure long enough to suit the acid pyro developer; but when I cannot do this. and quickness is essential, I then give as long as I can in the camera, I use the alkaline pyro developer, and —hope for the best. It is not always necessary that a person should work quickly; there are many subjects to which you can give five minutes, just as well you can give one. When a picture is under-exposed, and we try to make it up by developing, I look on the developer as being over-taxed—as being called on to do not only its own work, but some part that light ought to have done too. No wonder, then, that the developer fails. I think it better to proportionally distribute the labor, allowing the light to do its full share. I think it lamentable to put the sun on short time, or the plate on short commons. I sympathize strongly with a photographer when I see him struggling with an under-exposed plate, pouring his developer off, and on, anxiously staring into the deep shadows for the detail that won't come, and dreading the fog that generally does.

I employ Dallmeyer triplet lenses for my out-door work, using as small stops as circumstances will permit. My exposures have varied considerably—with the negatives before you the average being about five minutes, using a No. 2 triple and a medium stop. One negative is here taken with a No. 1 triple, that had only 30 seconds; and a print is here from another, a No. 4 triple, that had 15 minutes; but the 30-second picture was assisted by alkaline development, and the 15-minute one had acid pyro. The quick developer was thus used for the short exposure, and the slow one for the long exposure. Where circumstances will allow. I think it good to use two plates to each view; not only are you more sure of having at least one good plate, but, by taking advantage of the different nature of the two developers, an error of exposure may be corrected in developing the second plate.

As the plates develop quickly, any convenient method may be used to hold them. They may be held in the hand, placed on a levelling-stand, or a pneumatic holder with a handle may be used. This latter is my method. Wet the plate well, so as to moisten the film; and if the plate has received the minimum of exposure, proceed to develop it by the alkaline method. Make up a solution of—

Carbonate of ammonia	40 grs.
Distilled water	20 ozs.

Filter, and it is ready for use, and it will keep indefinitely. Pour sufficient over the wetted plate to amply cover; after flowing over, return the solution to the developing-glass, and while there add to each flutd ounce about as much dry pyrogallic acid as will lie on a shilling; it will dissolve immediately, and will not need filtering, Return the solution containing the dissolved pyro to the plate and the image will quickly reveal ifself. Allow the developing to go on till the details are seen by *reflected light*; for on looking through, scarcely anything will be visible : wash the plate well, and proceed to intensify. This is done in the usual manner, with the acid solution of pyrogallic, to which is added, at the time of using, a few drops of, say a ten-grain solution of nitrate of silver.

The following are serviceable solutions for use :—

Pyrogallic acid	2 grs.
Citric acid	1 gr.
Distilled water	1 oz.

Or,

Pyrogallic acid	2 gr.
Glacial acetic acid	½ drachm.
Distilled water	1 oz.

After the alkaline pyro has been well washed away, pour over the plate sufficient of the acid pyro solution to cover it; do this before adding the silver to it. The alkali that may remain in the film will thus be neutralized; return the solution to the developing-glass, add a few drops of the silver solution, and proceed with the intensifying. The previously weak image will quickly change into a strong and vigorous one. It is advisable not to make the image too dense in this stage, but to defer some portion of the intensifying till after the fixing in the hyposulphite. The fixing and successive washing completed, the plafe had better be examined, and the little additional intensity required given in diffused white light. I attach importance to this recommendation, as a great deal of the actinic density of these dry plates depends not so much on the quantity of the deposit as on the color, and this cannot be definitely known till the plate is fixed.

If the plate has had what we may term the normal exposure, it requires only to be well wetted, and either of the above acid solutions of pyro (to which at the time of using a few drops of the silver solution are added) to be flowed over the plate, and the development will proceed almost as quickly as in a wet plate.

It is desirable, in the first instance, to bring out the image with the least quantity of silver solution. The development can then be prolonged till all the deepest details are out, without the highest lights becoming intense. When the image is thus all developed, then is the time to add more silver and proceed with the intensifying, never, however, continuing it to the full extent but leaving the final touches to be given after fixing. If the picture appears over-exposed, the greater part of the intensifying should be done after fixing; but, if under-exposed, then as much intensity as can safely be given, should be done before fixing, because intensifying after has a tendency to increase the contrasts in the picture.

The negative thus duly intensified has only to be dried and varnished, and it is ready for printing.

These negatives have always a more or less veiled or slightly foggy appearance; this is only seen by looking at them; on looking through, the shadows are quite pure and quite transparent.

I look on the development as being by far the most important part of the process, and the one in which there is the greatest scope for the exercise of judgment. It was the reproach of the tannin process in its early days that all the pictures were of wiry hardness. My experience shows that there is no necessary reason why the pictures should be hard. If it be snfficient, it is all a question of development. The first object is to get out *all* the picture in the deepest shades before any strong density is produced in the high lights. This done, the intensifying can be calmly proceeded with. When, as in the old-fashioned way, the developing and intensifying were condücted simultaneously, there was always a danger of making the high lights too intense before the details were brought out in the shades. If, however, only the weak image be at first produced, then the manipulator has it quite under control, whether he shall produce a soft or a hard picture; for, if the exposure be enough, all weak pictures are soft pictures, and it is only as they are made too intense that they become hard. The exercise of judgment is required to know how far tc go, so as to secure vigor without losing softness.

When using the alkaline developer, there is no fear of the first or purely developing stage being past; for the developer, no matter how long you keep it on, in reason, will only make a weak thin image; it is in developing with acid pyro and silver the error may be made. If, however, only a very little silver be added to the developer, and patience be used, almost as weak an image may be produced by acid pyro and silver as by carbonate of ammonia and pyro. A well-developed weak image being obtained by either means, all the elements of a soft yet brilliant picture are secured the rest being the exercise of skill in intensifying.

By attention to these prints hard pictures may be avoided, and soft ones secured, not only the tannin, but I believe, by every other dry process.

A few words may here be said as to the merits of acid and alkaline development. I consider alkaline development to be a very valuable discovery, enabling us to bring out an image with certainly less than one-half the exposure otherwise required. This materially increases the usefulness of dry plates, and opens out untrodden paths f photographic discovery. The images produced by this means seem every bit as perfect as by the acid method; in fact, when the plates are done, I cannot tell the one from the other. I use the two plans according to requirements; for, while distinctly recognising the value of the alkaline developer, by no means pin my faith to its exclusive use. Where the circumstances are favorable, I still adapt my exposure to suit the acid method, as being the safer of the two. If I expose my plate for alkaline development, and I give too little time, I have lost my picture, for the acid method will render me no assistance; if I over-expose. then the acid method naturally comes to my assistance. In like manner, if I expose for acid development, and give too little time, the alkaline developer will be my friend. By this means I have two strings to my bow.

On the whole, then, I look on this discovery as a reserve of force —a something wonderfully useful to have recourse to when the usual means are quite inadequate; and as its usefulness is by no means confined to this process, I strongly recommend all dry-plate workers to add this new force to their powers.

I have already spoken of the image produced by alkaline pyro as being extremely thin and weak; it has been aptly termed a *phantom* image. Sometimes, with very short exposure, only the general outlines of a picture make their appearance. I have then found it advisable to increase the power by adding more pyrogallic to the developing solution. In rare cases I have used as much as ten grains of pyro to one ounce of the carbonate of ammonia solution, and have thus extracted a latent image that otherwise would not come forth. This is a potent photographic spell for bringing spirits from the vasty deep that can only be recommended in exceptional cases, as there is always a much greater chance of raising the spirit of darkness—fog—than the image we desire.

I have not found any advantage in increasing the strength of the carbonate of ammonia above two grains per ounce. Carbonate of soda has never succeeded so well with me as the ammonia salt.

The virtues of hot solutions have been duly recorded for bringing out images with short exposures; and, theoretically, a hot solution of alkaline pyro ought to be a most powerful developer. I cannot compliment myself, however, on the few essays in that direction; the results were rather humiliating than otherwise. Referring to these extreme and daring methods of development, I am reminded of an anecdote of three men who applied for a vacant coachmanship. A test-question was put to each—how near he could go to the edge of the road without going over. The first said he could go with perfect safety to within an inch; the second could go to a hair's-breadth; but the third said he always kept as far as he could from the edge, and preferred to drive down the middle of the road.

When I have been pushing the development in some refractory plate that has had scarcely a gleam of light, hunting up the latent image that declined to put in an appearance, dosing it with fresh and more powerful stimulants, pitching it in hot and strong defying fog, and treading on the very brink of destruction—under these circumstances, I have thought that, after all, it would be safer "to drive down the middle of the road."

The appearance of the plate after exposure will sometimes suggest the best of development. If the image be visible on the plate when it comes from the dark slide, it has certainly been sufficiently exposed, so as not to need alkaline pyro. Sometimes on wetting the plate only, the image will spring forth; in such case also the alkaline pyro will not be needed. Also when the image comes out on the application of the carbonate of ammonia solution, before the pyro is added, the plate may be well washed, and the remainder of the development entrusted to the acid pyro and silver. In this latter case the acid pyro must first be flowed over the plate to neutralize any ammonia salt in the film before the silver is added. If this precaution be omitted in this and analogous cases, there will be a certain fogging produced.

In the absence of any of the appearances named, the judgment must be used as to which developer to employ. It is sufficient to say that it is always safer to use the alkaline than the acid pyro where there is a doubt, as, although a plate with abundance of exposure will always make a better negative, if developed with acid pyro, yet, be the exposure ever so great, a picture can with care always be made from the alkaline-developed image.

I have only now to close by briefly summarizing what I have so circuitously stated. In short, then, I prepare my plate by cleaning the glass, coating it with collodion, sensitizing it in the silver bath exactly the same as for taking wet negatives by iron development; the sensitized plate, when taken from the nitrate bath, is put into a bath of distilled water instead of being put into the dark slide; it remains in this water till another plate is sensitized; then it is washed for about a minute under the tap, and a fifteen-grain solution of tannin is flowed over, and it is allowed to dry in darkness. When dry, the edges are varnished with black varnish, and the plate is ready for use. It will keep for certainly a month or two. If the exposure be sufficient, the development will be quite easy with the old-fashioned pyro developer and a few drops of silver solution.

If the exposure is short, the development must be commenced with carbonate of ammonia and pyro, and finished with pyro, and silver; and—this constitutes the whole process.

I cannot conclude without stating that I am glad of the opportunity of bearing testimony to its simplicity and great usefulness; and in the name of the workers in tannin (and their name is many) I then publicly thank Major Russell for first introducing and perfecting the tannin process.

After reading the paper, Mr. Hughes exhibited a fine series of prints, from tannin negatives, of Osborne, and also a number of negatives, in illustration of his process.

Enamelling Photographs.

Mr. A. Rollason sends us the following hints on the manipulations in his patent enamelling process: they will also be found of service in connection with all similar processes.

1st. When the pictures are taken off the plate in the usual way, the best cement which can be used for mounting them is Russian glue, it soon sets, and does not penetrate the back of the print like starch or paste.

2nd. When the pictures are dry, they may before removal be coated over with two or three coats of thick collodion, allowing each coat to dry before another coat is applied, this will also prevent any moisture attacking the back of the picture.

3rd. When it is desired to mount the picture, before taking it off the glass, the following is the method I have found most successful. Let the mounts be soaked in water and placed on each other, so as to be kept thoroughly damp and ready for use. Have a solution of gelatine also in stock, of the strength of one part of gelatine and six of water. Have some white foreign post, cut a little larger than the mounts.

When required for use, the solution of gelatine must of course be warmed sufficiently to reduce it to a fluid state, and not beyond this. Immerse the paper into a solution of gelatine, and with a flat camel-hair brush, flood the back of the picture on the plate, either before or after it is quite dry, then place on the paper, adjusting it, of course, examining for air bubbles, &c., after which, allow thoroughly to dry.

Finally, rub over the extent of the paper with paste, or glue, and also the damped mount, and place upon the paper, pressing down gently, adjusting, &c. When quite dry, cut them off in the usual way.

Any printing may be done on the foreign post, or any other paper used, but this I have found the best.—*Photo. News.*

Ornamental Borders around Photographs.

Sir,—I have forwarded by post a few specimens of medalion cartes, mounted upon ornamentally designed photographic borders, which method I think would be much better for photographers to introduce to the public, than lithographic or embossed ones, as the *whole* is a photograph still, and rendered ornamental by the aid of the artist.

As to the expense of producing them, the small extra charge the public would pay for, and if all who take them would adopt the scale I shall here mention, *cheapness* would be excluded. If, then four heads be taken on the plan of Messrs. Window & Bridge, for which I shall charge 2s. 6d., and then, according to choice, print copies at 1s. 6d. each of one of the heads, or 15s. per dozen. And I feel assured that only those would grumble at that price, who are the grumblers at the present prices.

I have enclosed you these specimens for your opinion, as I am sure you so well know the bias of the public mind in the direction of photography, and if you judge them promising of success, I shall proceed to execute them for sale to those photographers who would not design their own. One sheet of paper would print forty-five and I should charge a certain price per sheet, which would not be over one penny each carte, on an average, and photographers would save the extra paper: so they only print a trifle over the size of the oval shape.

One other thing I wish to mention, as the designs are registered, that would to a certain extent be a bar to the portraits being registered, as they could not photograph the ornament.

Any suggestion you could think of, I would feel favored by receiving. E. T. Brooks.

[We publish the letter of our correspondent, as furnishing a suggestion to those concerned. For our own part, we dislike any thing in the shape of border or ornament on the photographic picture. In our estimation, the more severely simple they are in *entourage* the better.—Ed.] —*Photo. News.*

The Wothltype Process.

Sir,—Touching the recent discovery in photographic printing by Herr Wothly, I feel disposed to trespass on your valuable time with a few remarks on the result of my experiments with this new method.

We are living in an age of great changes and discovery, and when it was announced to the world by the leading journal of this country that an entirely new process had been discovered, doing away with the use of silver, I decided in my own mind that a great revolution in photography had taken place. Since that great event was announced, I have been patiently waiting for the specimen which was promised to be delivered early in November. Now we have commenced the jovial month of December, and still we look in vain for the promised land.

In the meantime I find that the photographic world have not been idle, for, from various articles in your journal, I find many others as well as myself have been using their best endeavors to ascertain the real value of the invention.

The result of my efforts bring me to the conclusion that the Wothlytype process is valueless, for the following reasons :—

1st. Nitrate of uranium and silver combined with collodion as a vehicle, comes to about the same expense as our present printing process.

2nd. The amount of labor is about double.

3rd. The fact of silver forming a part in the combination renders it necessary to undergo similar care in washing.

4th. Its permanence is equally doubtful.

5th. For sensitiveness it is nowhere compared with silver.

I tried it on a stereoscopic negative by covering one-half with silver as now used, the former produced a faint print, after an exposure of two and a-half hours, the latter a good vigorous one in twenty minutes.

Now I ask a simple question, possibly some one connected with the U. A. Photo. Co. will oblige me by a reply in your columns. Why do we not receive the specimens? I have repeatedly applied direct to the company, and have received a printed circular which says anything or nothing.

Were silver the recent discovery and uranium the old process, my opinion is, that a company possessing their means could have produced by this time 20,000 copies, and all perfect.

Of what value, commercially, can a process be that requires six weeks to enable them to supply a single copy to each photographer who may have applied for one? GEORGE WILLIS.

[As to the facilities of the Association for supplying prints, or the reasons for delay, we know nothing. We can readily suppose many very natural reasons why a new company undertaking a new process should meet with delays; but we know nothing on the subject. We cannot quite agree with our correspondent's sweeping conclusions on the sdbject of uranium printing, and chiefly because as yet comparatively little is known on the subject. We find such varying results arise from varying conditions in our experience, both as regards excellence, sensitiveness, and facility, that we hesitate to say more than that the subject is well worthy of further investigation.]—ED., *Photo. News.*

A New Developer.

BY A. B. CROCKETT.

WHILE experimenting on the qualities of various developing solutions with the cooperation of Prof. A. E. Verrill, we found that the following combination produced negatives superior in every respect to any other known to us, and, deeming it, if of any value whatever, of too much importance to the art to be kept merely for private and secret use, I offer it to the public through your columns.

It is remarkable for working with great regularity and certainty, giving peculiar clearness and transparency in the shadows, without undue intensity in the high lights, while the development may be carried to almost any extent without danger of fogging.

The basis of this developer is a mixture of double sulphate of iron and potash with the double sulphate of iron and ammonia. But since the first salt cannot ordinarily be obtained from the dealers, its component parts may be added separately as in the following formula with which we have obtained in practice excellent results.

Water (pure)	32 ozs.
Sulphate of potash	½ "
Proto-sulphate of iron	¾ "
Double sulphate of iron and ammonia	1 oz.

To this solution add—

Ammonia	2 drops.
Acetic acid, No. 8	2 ozs.
Alcohol as required.	

It is best to add the ingredients to the water in the same order in which they stand.

The sulphate of potash should be crystalized and perfectly neutral. It can usually be obtained at ordinary drug stores sufficiently pure for the purpose.

NORWAY, Me., Jan. 23rd, 1865.

Clean Hands and Clean Pictures.

BY W. G. TWEEDY.

Doctor. Look how she rubs her hands.

Gentleman It is an accustomed action with her to seem thus washing her hands: I have known her continue in this a quarter of an hour.

Lady Macbeth. Yet here's a spot. .... Out, damned spot. out I say. One? two; why, then, 'tis time to do't. .... What, will those hands ne'er be clean; No more of that, my lord: no more of that, you mar all with this starting.—MACBETH. V. 1.

A SHAKSPEARIAN friend of mine, whose wife practises photography, says he is convinced, by the above passages, that Lady Macbeth was a worker in that black art; that the hand-rubbings, the complaints about spots (not to mention the bad language), the counting—one—two—of the exposure, and the caution to her husband about moving during the sitting, all harmonize so well with this hypothesis, that he intends some day, when he has completed his researches, to publish a volume to prove that Shakspeare was as great an adept in photography, as he was in divinity and law.

Undoubtedly the difficulty of keeping their dainty fingers stainless, is the great reason why we have so few lady amateurs; people have got to look upon black fingers as a necessity, and so perhaps they are when the old system of exciting the film is pursued. Some time ago I devised an arrangement for my own use, which is simple, efficacious, and absolutely stainless, besides being possessed of many minor advantages. In place of the usual dipping bath, I employ a glass dish, an inch or so larger each way than my plates, and half an inch deep. On the bottom of this, near one side, is cemented a strip of plate glass, ¼-inch thick and ½-inch wide, and on top of this another strap, ⅜-inch wide, is cemented, so as to form a rebate. A similar rebate is made for the opposite side of the dish, but it is not cemented down to the bottom, so that it can be placed at any distance from the first, to suit plates of different sizes.

The dish is placed on a level shelf, and filled ½-inch deep with bath solution, the plate is attached to a pneumatic holder, coated, the edge placed on the ledge of the fixed rebate, and quickly lowered, face downwards, on to the solution, the opposite edge of the plate resting on the ledge of the moveable rebate, which has been previously placed at the right distance to receive it. There is no danger of streaks or air-bubbles, if the dish is properly levelled and filled; and the edges and back of the plate are not wetted by the solution. When the film is ready, the plate is lifted by the pneumatic holder into an upright position, the holder acting as a support behind, and the lower edge of the plate resting on the ledge of the rebate, until it has drained enough, and it is then rested in the same position on blotting paper for a few seconds, and then placed in the shield,* the holder being removed only when the plate is resting on the silver corners of the carrier.

After exposure, the back of the shield is opened, the holder attached, and the development conducted in the usual way. In this manner the plate is never touched by the hand until the holder is removed after the final washing from the hypo, which is contained in a dish like the bath, and the surface only of the plate applied to it in the same way.

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* I think this Americanism worthy of adoption, in place of "camera-back."

A close-fitting cover excludes dust and prevents the evaporation of the bath when not in use; the quantity of bath solution is only one-third that of the old system, a few drops of solution added from time to time keeps up the level; there is no mess and waste of solution by drainings in the shield, the bath does not become charged with ether and alcohol, as these readily evaporate from its ample surface, and it requires no organic matter from dirty glasses, as the collodion only comes in contact with it. For professional work, especially, I am convinced that the advantages of this system are so great that it only requires to be known to be adopted.

I find great advantage in developing my dry plates in a similar way. I have frequently found that dry plates were spoiled by first wetting them with water, when they would otherwise have given good negatives. In all cases the wetting previous to applying the developer makes the development very much slower. I now attach my holder to the back of the dry plate, and place it, face downwards, on the pyro-alkaline solution; the image comes out rapidly : it is then washed under the tap, and intensified with pyro and silver, while another plate is being developed in the dish. I find that almost any kind of dry plate can be developed successfully by pyro and alkali in this way, which is not the case when the plates are first wetted with water; even plain washed collodion produces splendid negatives, if a few drops of a four-grain solution of gelatine is added to the pyro and alkali, and at least a dozen plates may be developed on the same solution, without its giving any sign of exhaustion.

I may on a future occasion give the results of my expereince as a dry-plate worker with various processes, and my system of preparation by which the trouble is reduced to a minimum; but I fancy I hear the Editor grumbling at the length to which this has run already, and to rein my hobby-horse, and wish all my fellow-workers, a Happy New Year.—*Photo. News.*

Double Salts of Chromic Acid.

THE following processes are given on the authority of M. Kopp in a recent number of *Chemical News*:—

DOUBLE CHROMATE OF POTASH AND AMMONIA.—By finely pounding bichromate of potash with concentrated caustic ammonia a straw-colored magma is obtained, whilst the ammonia is in excess; on being left in contact with the air the ammonia disappears, and the mass takes a gradually deepening orange tint. By dissolving with heat bichromate of potash and caustic ammonia a large quantity of ammoniacal gas is disengaged by boiling, and on cooling there is generally obtained a mixture of crystals—some yellow, and others orange.

M. Kopp considers the following the best method for preparing

PURE DOUBLE CHROMATE OF POTASH AND AMMONIA.—Introduce a certain quantity of pure bichromate of potash into a strong spherical flask and pour into it pure and concentrated liquid ammonia, shaking constantly until the strong and persistent odor of ammonia indicates an excess of volatile alkali.

Stopper the flask well, and heat it in a water bath until the contents are completely dissolved. On cooling, the double salt crystallises in abundance and in a perfectly pure state. Open the flask, decant ni the mother liquor, and dry the crystals under a receiver over quicklime, and in a slightly ammoniacal atmosphere. If the crystallisation has been rapidly effected this double salt crystallises in long, fine, and transparent needle of a light sulphur color; or in four-sided prisms, apparently with rhomboidal base, the summits of which are frequently feather-edged, in consequence of the replacing of one or two edges by inclined facets. By slow crystallisation of not too much concentrated liquids after slow cooling, sufficiently bulky crystals are obtained.

This salt contains no water of crystallisation.

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Improvements in Vignetting Portraits.

THE following is the specification of an English patent by Mr. Sarony, of Birmingham :—

" My invention has for its object the production of *cartes de visite* or other photographs similar in appearance to crayon drawings, ordinarily knawn as Richmond drawings and crayon heads. I effect this by a double process of vignette—vignetting direct with the camera.

"Firstly, I produce the bust of a person sitting, or any other object required—vignetting that portion only that is seen in the finished picture—by the use of a properly graduated glass suspended within the non-focal rays of the posterior of the lens, thus protecting certain portions of the plate from the action of the light.

"Secondly, I place before such portions of the said plate as has been acted upon by the light an inverted or reversed vignetting glass, in such a manner as to secure the said part from any further action of the light, whilst that portion of the plate previously unacted on is now brought into the focus of a drawing which is placed before a lens, and which represents the aforenamed Richmond or scroll drawings, the result being a scroll vignette or photograph. The same effect may also be obtained by the process known as double printing."—*Brit. Journ.*

Photogalvanography.

BY M. CAREY LEA.

SOME years have now elapsed since photography was first applied to the production of metallic plates from engravings by the aid of the electrotype process, nevertheless the information on the subject which has found its way into print is of the very scantiest kind. I had occasion about a year since to attempt the production of copperplates in this manner, and found it impossible to obtain any information to guide me. I was aware that Pretsch in London had been for a long time executing such work, and that a company had been formed in New York for producing a different variety of work, but on the same general principles. I very soon found that I could obtain no information of any value as to the details of the processes used, and should have to work out the method for myself. After some trouble I succeeded in doing this, and I believe that I may save time and vexation to others by communicating results. As for how far these details are the same as those of Herr Pretsch or the New York Company, I cannot of course know; they are original as far as I am concerned. If they are entirely original, they will be all the more interesting;—and if they have been used they have so far as I have been able to judge, never been published. Of course the basis of all these processes is the same,—the action of light on a mixture of bichromate of potash and gelatine. The gelatine in those portions of the picture which have been acted upon by the sun, does not swell up so quickly or so much when it is immersed in water, consequently the design appears in relief. This wonderful passage from a mere difference of tint upon a flat surface, to a difference of actual level, immediately suggested the possibility of moulding the relief obtained on some hard metal and of printing from it. Herr Pretsch seems to have been the first to reduce this to actual practice, but so far as I know, his formulas, and the mode of operating employed by him have never been given to the public.

The first operation consists in pouring a solution of gelatine and bichromate of potash upon a clean piece of plate glass of a proper size; the coating of gelatine must not be too thick or too thin, and it is especially necessary to get exactly the right proportion of bichromate Where paper is covered with gelatine and bichromate as in some of the photolithographic processes, a much larger proportion of bichromate can be used than in the present case where glass must be used. On glass, the bichromate is much more apt to crystallize in drying than on paper, which of course spoils the plate. The proportion of bichromate must not on the other hand, be reduced more than is necessary to give security from this trouble, or the sensitiveness of the plates would be impaired and the results generally less favorable. The proportions which I finally adopted were the following, viz.:—

Gelatine	200 grains.
Water	4 ounces.
Saturated solution of bichromate of potash	5 drachms.

The saturated solution of bichromate of potash is to be prepared by dissolving a quantity in hot water, and allowing it to stand twenty-four hours in the working room. Of course the amount which remains in solution will depend to a considerable extent upon the temperature of the room. By adopting a standard of this kind instead of giving a fixed number of grains, we have the advantage that the solution is rendered a little stronger, or a little weaker, just as the season and temperature of the air of the working room demand.

The gelatine should be the best and purest that can be obtained; I prefer Cox's sparkling gelatine for the purpose. It is to be placed in the water, allowed to swell up for some hours, and the vessel containing it is then to be placed in water so hot that the the fingers can only bear it for a moment. At the same time the bichromate solution is to be added, and the whole quietly stirred, carefully avoiding to introduce bubbles. Solution takes place rapidly. It is then to be carefully skimmed, and if not perfectly clear and transparent, it must be filtered. When all the materials are of the best, and the operation is conducted carefully, filtration is scarcely necessaay.

The warm solution is next to be poured upon the glass, much in the same way as collodion, except that as it does not set so rapidly the manipulations may be more leisurely. Bubbles of course must be carefully avoided. The easiest way to get rid of them, is by touching them in the solution with the sharp corner of a piece of soft blotting paper. Holding the plate at an angle of about 45°, let the excess of solution drain slowly off, then place the plate on a levelling board, and leave it twenty-four hours to dry.

The glass plate when thoroughly dry is placed under a negative and exposed to the sun. The quality of the negative has necessarily much to do with the success of the subsequent operations. It must be clear, sharp, strong and unveiled—such a negative as will when used for printing on chloride of silver bear an exposure long enough to bronze the blacks without the whites suffering. The same directions which apply to the preparation of negatives for photolithographic purposes, apply equally here, for although the two processes are so different, yet the requisites in the way of negatives, correspond closely, the object being in both cases to obtain the strongest contrast between the whites and blacks. Under such a negative, the prepared plate is to be exposed to the direct sunlight for from two to three minutes. It is next to be plunged into water, and left there with frequent changing of the water, for a couple of hours, to completely remove the unaltered bichromate. It is next to be allowed to dry.

The old system of giving conducting power to a non-conducting surface by means of fine dust of graphite, is not applicable here. We want a fine and more equal covering than graphite can give. I had heard that in one of the establishments in which this work was carried on commercially, the conducting was obtained by gilding, but was unable to learn any particulars. I therefore brushed an ethereal solution of chloride of gold over the surface of the gelatine, and when dry, brushed it with protosulphate of iron. But the reduction, which in solutions takes place instantaneously, was here extremely slow and irregular, the gold was deposited in small patches, with the most beautiful iridescent colors and even after much time no satisfactory coating was obtained. It then occurred to me to hasten the reduction by the action of direct sunlight. After brushing the plate with gold solution, I placed it in sunlight and applied the protosulphate. The difference was extraordinary, the effect of the sun's rays almost magical. The reduction which previously had been so slow, and so irregular, took place like a flash and the whole surface of the gelatine became covered with a bright yellow coat of metallic gold.

Although satisfactory coatings were obtained in this way, I soon found a quite different method of preparing the surface to which I gave the preference, and used as long as my experiments lasted, exclusively.

It was as follows :—When the plate was perfectly dry after washing out the bichromate, I made a saturated solution of nitrate of silver in warm alcohol, and with a camel's-hair pencil applied it to the gelatine surface. This was allowed to dry, and then another, and a third coat, was applied in the same way. The plate thus prepared was then simply fogged with pyrogallic acid whereby a smooth, even deposit of metallic silver was obtained, just such as is requisite for receiving the deposit of copper. When the fogging is completed, the plate is to be thrown into water to cause the gelatine to swell, and the relief to appear.

The next step is in attaching a proper conductor to the glass plate. This may be done with sheet metal or with wires. Cut a triangular piece of sheet metal to such a shape that the base shall be as wide as the longest side of the design on the plate, and let the two sides taper gradually so as to be several inches longer than the height of the plate. Bend the base over so as to form a hollow for the plate to rest in, cut the edge sharp and turn it in so that it may rest on and press it into the gelatine at a point on the plate below the design. This end which thus bent over serves to support the plate, and hold it steady. The narrow end of the triangle is to be bent over into an arched shape, bringing the point down, preparatory to resting it in the mercury cup. When a wire is used, it is first bent into the shape of a greek lambda Λ, it passes behind the plate, the two ends are bent forward and round so as to afford points of contact, which, it is scarcely necessary to say, must be without the design, the apex of the wire is also bent forward and rests in the mercury cup.

It will easily be seen that these methods which I describe, were those that I used,and apply only to small plates. Had I had occasion to work with larger, I should have supported them horizontally instead of vertically, using a separate sulphate of copper bath for each plate.

For depositing the copper either of the methods in use may be employed. I took a large glass vessel and fastened across it two strong pieces of sheet copper. These supported the points of the wires just described, actual contact being insured by the use of nitric acid and mercury. The glass vessel was divided vertically into half by a large sheet of thick copper which fitted loosely and to which one pole of a pair of Grove's cells was attached by a binding screw. The other pole was similarly connected with the two horizontal strips in which were the mercury cups. Of course the same result may be obtained by a single vessel containing the acid and copper solution by a porous diaphragm, but for work of this kind the first arrangement will be found the most convenient, and any one with very moderate skill can arrange for himself an apparatus capable of working half a dozen small plates at once,at a very moderate cost.

To obtain the requisite thickness in copper, the plates will require from five to seven days, or thinner plates may be made and backed with type metal.

Such are the details of the method which I employed, and I think they cannot fail to be useful to those who may desire to work at a process respecting which so little has ever been made public. It will be found in practice to be an interesting and beautiful work. It is always, however, necessary to keep the conducting film entirely on the surface of the gelatine and if it sinks at all into it, of course the deposit of copper follows it, and the surface of the copperplate is thus rendered rough and uneven. It is to obviate this that I have advised to apply the gold or silver solution dissolved in ether and alcohol, and to apply it to the plate when dry, swelling it up afterwards. If a deep relief is required, the metallic solution may be applied before the plate is quite dry. When the metallic solution is applied to a dry plate, care must be taken to make it barely thick enough to conduct the electricity—if we go beyond this we get a film too stiff to permit the gelatine to swell under it, and the plate is spoiled. When the copperplate after acquiring sufficient thickness is detached from the gelatine, it will usually require to be carefully polished, and the best way to effect this is to use very fine dust of charcoal on a piece of kid or chamois leather.

Finally I may remind those who are not familiar with electrotyping that the power of the batteries must be properly adjusted to the work it has to do, and that the quality of the copper deposited will depend entirely on this. When the adjustment has been right the copper deposited is as fine and tough as the best rolled metal, of which it has the exact color after polishing with charcoal.

PHILADELPHIA, Pa., Jan 5th, 1865.

Actinism of Snow.

A CORRESPONDENT, " C. P," whose letter appeared in our last issue, has fallen into a not uncommon error with reference to the relative activity of differently-colored rays of light reflected from differently-colored surfaces—two very distinct subjects for consideration.

When the rays of the solar spectrum are separated—or partially separated—by dispersion, undoubtedly the blue rays and those invisible rays beyond them are more actinic than the remainder; but it is *not* true that light reflected from a blue surface is more actinic than the same reflected from a white one; for the simple reason that the white surface reflects more, and absorbs less, of the incident light of all kinds than the blue one does. It is true that, as a rule, a blue surface absorbs less of the actinic light than a yellow surface does, though the latter may absorb fewer of the luminous rays; but it is equally true that a white surface absorbs less of both kinds than either of the colored surfaces do.

It is, therefore, only what might have been inferred *a priori*, even supposing the light to have been reflected from the blue sky and white snow, that the former should not have made so vigorous an impression on the collodion film as the latter. But the fact is, the light was *not* so reflected at all in the case cited, as we are sure the gentleman will at once perceive on his exercising a little more reflection of his own.

The bluer the sky, the less of reflection there is from it—not because of its color, but because it is not a surface from which light is turned back, as in the case of snow. Indeed, of reflection properly so called, there is but little. Such light as the sky possesses is due rather to radiation from the particles of moisture suspended in the atmosphere; and some very interesting facts connected with this part of the question have been observed and recorded by Mr. Glaisher during his balloon ascents, whereby it appears that the blueness of the sky is a consequence of the absence of moisture, the intensity of color increasing as moisture decreases. A photographer will surely have observed that a white cloud in the sky is more active than surrounding blue in impressing the sensitive film.

But to return to the snow. It both reflects and radiates more light than the atmosphere; and, lastly, if the intensity of the light from its surface be compared with that of the brightest sky, irrespective of color, the former will always be found the greater of the two, though the difference is not always equally marked.—*Brit. Journ.*

Rectifying the Bath.

About four months since during a term of cloudy weather, I had occasion to correct my sensitizing bath without the aid of sunshine, and I succeeded better than I expected; the method is a simple one, but if the bath is very foulit requires time and patience. I will describe what I did :—Evaporated to dryness, and a very dark colored filthy looking deposit was obtained. I dissolved it in as small a quantity of water as was requisite, filtered it clear, and evaporated again to dryness; this time it looked better but was not clean. I repeated it again and again, until six evaporations were completed, when I obtained a clean looking granulated mass somewhat resembling first quality brown sugar. I then added to each forty-five grains of this salt one ounce of rain water; filtered the bath and found it all right. I have since corrected several in the same way, with the same result. It requires no addition of iodide, and a plate sensitized in it requires less exposure than any other bath I have used.

A. Griffing.

Enamelled Photographs.

Various plans have been described in ths Journal for giving a highly glazed surface to an ordinary print. Of these the following for the invention of which there appear to be several claimants, is probably the simplest and gives the most desirable effect.

Clean a sheet of plate glass as if for a negative, and flow over it thick plain collodion. The collodion should be such as gives a tough film. When dry pour over it a warm solution of gelatine, Cox's is the best. The strength of this solution is not very material; one ounce of gelatine to a pint of water will answer well. The plate is now to be dried, and in that state is ready for further use. The plates so prepared may be kept on hand for any length of time without deterioration. Those who adopt the process will find it most convenient to prepare at once as many plates as they will require for a week or a month.

The print to be enamelled, may be on albumenized or plain paper; the improvement of finish will be most striking with the latter. The print is dipped in water for a moment, and the superfluous drops of water being shaken off, is laid with its face on the prepared glass, care being taken that no air bubbles interpose. The paper is smoothed down with a soft handkerchief. A soft cushion composed of several folds of cloth is now laid upon the plate, a piece of board on the cushion, and finally a weight upon the board. The whole is left in this condition till the print is dry. The print having the collodio-gelatine film attached may now be easily removed from the glass.

If the glass plate be large several prints may be laid side by side. To those who have not tried the process, we earnestly recommend it. If it be found too troublesome for ordinary work, it will be found at least useful for preparing fine specimens for the show case.

Editorial Department.

——A name is wanted for photographs on opal glass. A good many have been already suggested, and perhaps a dozen are actually in use. No one name however is very prominent; opalotype, albatype, porcelainotype, enamel photograph, etc. are pretty fair, but we want something so good that all will spontaneously adopt it. The man who invents the name may have the satisfaction of believing that he is the only man who has lately invented anything useful pertaining to the pictures.

Minor Correspondence.

F. F., of O.—"Will you be so kind as to publish in your invaluable Journal for the benefit of your readers the best process for reducing silver waste of all kinds to metallic silver; or, in other words, how to assay it, what flux to use for different kinds of waste, provided the publication will not interfere with your business. There has been a process pedlar through this section, giving instructions for saving silver waste, charging $10 per victim. Disclose the whole thing and he may go to the plow, or the pick and shovel, where he belongs." ....We have no objection on account of our business to tell in this Journal all we know about the treatment of photographers waste. But we do not profess to have anything new in the process which we use; indeed it has in one way or another been published in this and all other photographic journals. I may be advisable, however, to collect together the scattered information for a single article; we will think of it. The reducing of silver is a process which no one can carry on profitably without good facilities and the skill which experience alone can furnish. We venture to say that those who have purchased the $10 process, even it be a good one will lose at least that value in trying to follow it. Every man to his trade.

CARTHAGE.—"If J. S. S,. of Pa. will send his address to Drawer, 19, Carthage Jeff. Co., N. Y., he will receive a photagraph of Grant that is good. What are poor prints and trimmings worth per pound that are silvered on an 80-grain solution?" ....Such silver waste is worth from $1 25 to $2 25 per ℔; but it should be bought and sold only on assay.

J. V. W., of Ills.—"What plan, if any, by which a person could make a substitute for a solar camera adapted to the use of country artists who have but little enlarging to do, and could not afford the outlay of solar camera? Is there any of the aniline or albumen colors that are put up for sale permanent, and if so, what ones? I have not been able to find them." ....We cannot easily in this place describe a cheap substitute for the solar camera. But it seems to us that any person who understands the principle of copying and enlarging, could make one to suit his convenience. Bear in mind that a condensing lens is not necessary. ..The yellow and green we put up are permanent; all other liquid colors with which we are acquainted are fugitive.

D. H. B., of O.—"Is there no cause for pinholes but excess of iodide of silver in the bath and excess of iron in the developer I have tried to get rid of them, by strengthening the bath with nitrate of silver, and diluting the iron in the developer, but failed." ....The iodide of silver produces pinholes by reason of crystalizing in or on the film, the crystals then becoming detached, thus leaving bare spaces. No doubt there are other substances which may be found in the bath which will act in a similar way, acetate and oxalate of silver, for example. Particles of dust from the air falling on the film often produce pinholes.

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Lines in the Direction of the Dip of the Plate and their Avoidance.

BY T. SEBASTIAN DAVIS.

(Read before the South London Photographic Society Jan. 12th, 1865.)

During the progress of some photographic work, in the early part of last season, I suddenly encountered an unwelcome apparition in the shape of strongly-marked lines upon the collodion negative in the direction of the dip of the plate. It happened in this, as in many other similar instances, that the critical examination for the existence of a particular defect revealed its presence as more generally traceable than might otherwise have been expected. It must be remembered, moreover, that markings in the direction of the dip of the plate are far less apparent in those parts of a negative covered with strongly-contrasted lights and shades than upon an evenly-lighted and plain surface. The apparition caused me considerable trouble, and it was only after the exercise of some patience and perseverance that I finally succeeded in exorcising it from my presence. Under these circumstances it may not be uninteresting to describe the various experiments I made during the struggle to remove my offensive visitant, and the means by which any of you may prevent a similar intrusion.

My attention was naturally directed in the outset to the condition of the bath, and to this more especially as the collodion employed was made according to a formula that I had used for some time previously with every satisfaction, and to which as I supposed, I had rigidly adhered. The presence of a large quantity of ether and alcohol in the bath solution was naturally the first and most probable supposition that suggested itself. In order, therefore, to eliminate any excess of ether and alcohol, and also to remove any other probable impurity, the bath was submitted to a treatment that generally cures it of any trifling disease. In the first place it was treated with its own volume of water, and the precipitated iodide of silver separated, then made sliightly alkaline, and "sunned;" afterwards evaporated to a small bulk in order to remove the alcohol and then, having been made up to the right quantity with distilled water, a homœopathic dose of nitric acid was finally added. Notwithstanding, however, this systematic treatment, and although it worked excellently in every other respect. the plates sensitised therein still showed the existence of the dark lines in the direction of the dip as before. Thinking it, therefore, not altogether improbable that either an excess of alkaline and cadmium nitrates or organic matter might yet be present, made a new bath of pure nitrate of silver, and also obtained one already prepared for use from a leading photographic chemist. The defect, however under consideration was still persistent, and in no case yielded to any amount of final washing before the introduction of the plate into the dark slide. The only diminution of the evil occurred when using a bath containing much less than the usual quantity of nitrate of sllver in solution.

Finding that no decided success attended any alteration in the composition of the bath, I was led to the supposition that the evil must originate from some incidental peculiarity in the composition of the collodion. To test this upon the sensitising solution I iodised different samples of good plain collodion with pure iodide of cadmium, sodium, and magnesium, respectively, instead of a combination of two in union with a bromide as previously employed. The result of separate trials with collodions so made, showed that the apparition was not to be thus scared, and I only learned from the experiments that it paid a slight complimentary preference to that containing iodide of cadmium alone. The presence of bromides in the collodion was shown to be disconnected with the effect, and as I afterwards also found the presence or absence of free iodine.

I had now, therefore, no alternative but to direct my attention to the composition of the plain collodion itself. The samples that I had been using in the foregoing experiments were made with a pyroxyline manufactured with acids at a medium temperature, and in such a state of dilution as to yield a film neither particularly powdery nor tenacious. I prepared, therefore, two fresh samples of opposite kinds—that is to say, the one made in acids diluted to an extreme degree, and the other in the strongest fluids compatible with the production of a soluble cotton. I had great expectations that I should be able to gain some manifest indication of the cause of the peculiarity; but great expectations, in this as in some otner instances, were doomed to disappointment.

Finding, therefore, that collodion prepared with either kind of pyroxyline exhibited the anomalous defect, I had now, as far as the composition of the bath and collodion were concerned. but one little expectation left, and that consisted in the examination of the characters of the alcohol and ether, and the proportions in which they were combined; but the mystery became more mysterious when I found that no alteration in the proportionate quantities of the ether and alcohol, no substitution of methylated for non-methylated, hydrous for anhydrous spirit, proved availing. Under these circumstances, I re-read a paper by Mr. Thomas, and the discussion thereupon by the members of the Photographic Society, in which the former suggests that lines in the direction of the plate are produced by actinic light falling upon the collodion film before the bath solution freely flows over its surface. Although disinclined to believe in the correctness of the theory, I thought it worth while to prepare some plates in the presence of the smallest amount of non-actinic light possible, and even in darkness itself; but found, as I had expected, the defect produced in an equal degree as under ordinary conditions. Placing these facts together, I could not but consider that the effect complained of had occasionally presented itself to the notice of the most skilful photographers, and to the manufacturers of the best collodions, but that no efficient remedy for its avoidance had been suggested.

After making the various experiments as detailed, and some others that I need not specially describe, a scrupulous examination of the plate before exposure led me to the conclusion that the lines of intensity are faintly visible before development under favorable circumstances of illumination. This I found to be the case upon taking a plate as ordinarily prepared, thoroughly washing it, and then submitting it to a critical examination with the light thrown thereupon at the best angle for the detection of the minutest markings. The question now naturally arose as to whether these lines are formed simultaneously with the first dip of the plate in the bath, gradually, or during the time of the repeated elevation and re-immersion of the fitm in the bath. To discover this I introduced a plate into a glass bath, previously placed in the best position of dull daylight for detecting any visible change in its appearance. After the introduction of the plate into the silver solution placed in the position described, I was enabled to detect a *gradual* formation of the lines complained of, and these increased to their greatest intensity in about three-qarters of a second. It is useless to say that I had now a clue to a method of manipulation by which their formation may be completely avoided.

This methad consists in lifting the plate a few times in and out of the bath immediately after its first introduction therein. Subsequent trials of this manner of manipulation have proved that it is one which constitutes a perfect cure for the evil complained of, and that it is efficient under the most refractory conditions. I therefore recommend, contrary to general instructions, that the collodionised plate be lifted in and out of the nitrate of silver solution a few times immediately after its first immersion, and the result will be great evenness ot sensibility, a quicker preparation of the plate for the dark slide, and the avoidance of lines in the direction of the dip of the plate under circumstances otherwise favorable for their production.

Rendering of Complexion in Photography.

Sir,—In the *Photographic News* of 11th of November, at page 550, the following expression occurs :—

"To those who bear in mind that the human face is rarely of one shade, and that it still seldomer emulates shirt front or collars in whiteness, the lavishness with which many, even of the leading photographers, whiten the faces of their sitters appears almost offensive. But they have no choice. Neither men nor women like to be credited with darker skins than need be; and there is some excuse for them in this case, in the defects of the art itself. Photography behaves very well to you. The white skins and purple bloom of youth fare well enough upon the sensitive plate. But when disordered livers and hot rooms have communicated a tint of yellow to the brow, and have transmuted the bloom of youth into a patch of brickdust, the silver salts are ungallant enough not only to record but to exaggerate the fact."

It is interesting when we find statements so important as the above, verified by practical illustrations. G. A. Sala, in his American article, in the *Daily Telegraph*, Wednesday, Nov. 23rd, 1864, observes :—

"General George Buriton M'Clellan is very slight in stature, and bears no very close resemblance to the many photographs published of him, in which, by aome eccentricity of the solar limner, he is represented as dark almost to swarthiness, both in face and hair, and with a heavy sluggish expression of countenance. His skin seemed to me almost as fair as that of a woman, his hair just brown, and his moustache quite light. In fact, he is a warm blonde; not quite tawny, and decidedly not carrotty, but what in French is termed *un chatain roux*."

The heaviness of expression was perhaps caused, in part, by bad lighting, but no doubt the swarthiness was the result of the yellow tinge of the General's skin and hair. In one of the best portraits which I have taken, in which every detail of the face is sharply and clearly portrayed, the same swarthiness is manifested and from the same cause. H.

[The peculiar tint of complexion is often difficult to render by photography. But the skilful photographer, whilst admitting the difficulty, instead of succumbing to it, only regards it as rendering necessary more skill and care. There are very few cases indeed in which by judgment in lighting, exposure, intensifying, and, in fact, general management of all the materials and manipulations, the proper suggestion of complexion may not be duly rendered. The merely mechanical photographer, who treats every subject in the same manner, without a special modification to meet the necessities of special cases, will produce such portraits as that of M'Clellan, to which Mr. Sala refers.]—Ed. *Photo. News.*

Pouncy's Carbon Process.—Further Improvements.

Mr. Pouncy is ever active and energetic with a view to perfect his process in printing ink. We may as well allow him to speak for himself, an extract from a letter just received; and we would premise that the half prints to which he alludes are from a negative of our own, with the capabilities of which for silver printing we are quite familiar. We may also be allowed to add that the half from which the gelatine has been removed is at least as perfect in tone in and detail as the best silver print we have ever been able to obtain from the same negative :—

"I have lately worked on sheets of gelatine, which, if kept perfectly dry, answer very well, and will prove, I think, more simple for transferring, and also obviate the fancied objections some persons have taken to printing through the paper. I enclose you a specimen cut in halves. One half you will perceive has the gelatlne left on, which presents all the appearance of wbat *some* have lately called enamelled photographs. The other hsa the gelatine washed off with sponge and warm water, leaving only the coloring mattor forming the picture, which cannot be effected by damp, or light, or time. This fact cannot be asserted of any other photographs but those produced by my process, not even of other carcon photographs that are produced by a water development. Here I beg to remind you that engravings, books, &c., on which we can depend for stability, are produced with a greasy ink, the greasy matter playing a very important part in its capability of resisting the atmospheric influences. We know that damp operates on the paper, and would operate also on the coloring matter were it not for the oil, varnish, or other fatty matter in conjunction therewith. Such being the case. I hold it to be impossible to obtain equal permanency with coloring matter held in a water solution; hence you will perceive the permanency of printers' ink cannot be obtained by any photographic printing unless a spirit developer be used. I think you will see also from the enclosed how simple it is to transfer my ink photographic printing unless a spirit developer be used. I think you will see also from the enclosed how simple it is to transfer my ink photogrphs to enamelled surfaces or glass; and, if mounted as Messrs. Helsby's and Mr. Keith's, we have a right to claim for them *absolute* permanency, whereas a silver picture on the same may fade as on an albumenised surface. As these facts have hitherto been overlooked, I will thank you to bring them before your readers in your next issue.

"JOHN POUNCY."

—*Brit. Journ.*

Enlarging by the Lime Light..

SOME time ago, when treating of the advantages likely to accrue from the substitution of artificial for solar light in the production of enlargements, we took occasion to contrast the amount of actinic force residing in the magnesium light with that of the oxyhydrogen, the latter of which we stated to be low. We then detailed some experiments which had taken place in the studio of Mr. Harman in our presence.

A short time since we received a courteous invitation from Mr. Aldis to witness the method of enlargement employed by him. We had previously seen some enlargements, by this gentleman, of a very large size indeed—eight feet long—which were stated to have been produced by the lime light, low as its actinic power wa alleged to be; and, feeling some interest in the subject, we gladly availed ourselves of his request that we should witness the *modus operandi.*

It will not, perhaps, greatly surprise our readers when we say, about four hours after sunset we found ouselves present to witness a photographic printing operation, so generally associated with sunlight. On entering the operating room we found placed before the fire a jar of gallic acid solution. Mr. Aldis explained that, in the winter months, he always adopted the precaution of warming the developing solution : in summer it was of minor consequence, but in winter it was necessary. With respect to the presence of acetate or other salts of lead in the developer, he found that he obtained equally good results without them; hence he discarded their use, at least in the development of positives on paper.

The general arrangement for enlarging was that of the magic lantern, that is to say, a compound condenser—on the one side of which, and in the focus, is placed a lime light, as close as convenient to the condenser; on its other side is placed the negative, outside of which is placed a compound achromatic object glass. The light employed, we have said, is the oxyhydrogen. The gases are contained in two separate bags, and are brought into union at about the distance of two inches from the orifice of the burner. Each bag is subjected to a pressure of two cwt., or about double that usually employed. It is, of course, to be expected that any bag subjected to such pressure for any length of time would show symptoms of weakness; but Mr. Aldis has an ingenious arrangement by which the cover of the pressure boards on which the weights are adjusted may be hoisted up entirely away from the bags. so as to relieve them from pressure when not in use. By turning a winch handle, the pressure is removed or applied without any loss of time.

For ordinary purposes Mr. Aldis uses common carburetted hydrogen; but when an enlargement of extra size is required, he prefers pure hydrogen instead of the common coal gas, as he finds the power of the light greatly increased by this means. The diameter of the condenser employed was five and a-half inches.

The paper used was Hollingworth's. It had been iodised previous to our arrival. The method employed by Mr. Aldis is to float it for a short time on a solution of nitrate of silver, drying, afterwards floating on a solution of iodide of potassium, and finishing with a copious washing in water, by which the pure iodide of silver is left on the surface of the paper. The paper was excited by pinning it by the corners down to the table, and charging its surface with aceto-nitrate of silver, of the strength of forty grains to the ounce. The silver was applied by means of a pledget of cotton, and it was then allowed to remain for about two minutes; after which it was warmed before the fire, and pinned up in its place to receive the image, which had previously been focussed on another sheet of paper.

The gas being then turned on, the exposure was proceeded with, and lasted exactly two minutes. The negative was a moderately dense one, and not of the kind most favorable for enlarging. With a suitable negative—sharp, thin, clear, and full of detail—not more than thirty or forty seconds would have been allowed.

Removed to the operating table, the sheet of paper was converted into a dish by turning up its edges and fastening them by clips at the corners. A quantity of the warm gallic acid was now poured in, and in the course of a few seconds the image began to appear. The development was continued for a few minutes, or until all the details were visible and the tone sufficiently black.

The gallic acid was now removed, and the print taken to a washing trough, from which, after being rinsed, it was removed to a similar trough containing hyposulphite of soda. In this it remained for twenty minutes, or until properly fixed, when another and more prolonged exposure in a washing trough completed the operation.

The whole time occupied from the beginning of the exposure to the completion of the development wae exactly nine minutes, two of which, as we have said, were occupied by the exposure. The actual time occupied in the development was about five minutes and the picture resulting from this experiment was of as fine a quality as could have been desired. The size of the negative was that of the ordinary *carte de visite ;* the size of the enlarged print being the full sheet of Hollingworth's paper.

Much of the success obtained by this method of enlargement was doubtless due to the manipulative dexterity evinced by Mr. Aldis; but it establishes most incontestibly the fact that, to secure enlargements of the most satisfactory character, daylight is by no means necessary.—*Brit. Journ.*

Zinco-Photography.

BY WM. CRAIG.

I ENCLOSE for your inspection a specimen the result of a few experiments I have made lately, towards obtaining an engraving on zinc or other metal by a chemical process.

I shall make some further experiments as soon as I will have an opportunity of doing so; at present I am not satisfied as to the exact proportions which produced the best results, therefore I will only say that the negative being taken, the metallic plate is sensitized, on which from the negative a print is made by exposure to the light. The solution in which the plate is then immersed acts on it in such a manner so as to produce this engraving, from which with a proper press and ink a print can be obtained. Now if this process can be brought to perfection, as I have great faith it will at no distant date, would it not greatly facilitate the art of engraving as well as cause a general revolution in the present system of photography?

If you think this worthy of notice, I will probably on some future occasion lay before your readers more satisfactory results.

[The specimen is very good. Mr. Craig ought to be encouraged to go on with his experiments. A way of producing photographic impressions which can faithfully and practically be multiplied by the printing press, will prove of untold value. The subject is well worthy of notice by everybody, and we desire to hold our correspondent to his promise of communicating something further to our readers.]—Ed.

Brampton, C. W., Jan. 13, 1865.

Decanting vs. Filtering.

Mr. Editor—Enclosed find a circular giving particulars as regards an improvement we are about to bring before the photographic fraternity.

We would like to draw your attention to a weak point in picture making, namely, organic matter in the silver solution. Among the many impurities found in photography, and perhaps the most annoying, is organic matter. When troubled with streaks, fog, or pinholes, it is a sure indication that organic matter has been introduced into the silver solution. Now there are several methods that have been recommended to obviate this evil, yet none have proved effectual only for a short duration.

Now we have found after long experimenting upon the mode of treating the silver solution with the Decantor, that it works longer and better than through any other treatment, from the fact that the organic matter will settle when it cannot be filtered out, and that more impurities will settle (during the night even) than can be filtered out, even if filtered ever so close; but we need not write to explain, for we are convinced the idea speaks for itself.

Yours, respectfully, Doty & Stein Bros.

[The Decantor is an ingeniously contrived apparatus, for pouring off the clear liquid from its sediment. We are thoroughly persuaded that for the silver bath, the decanting method is better than filtration. In filtering, impurities are extracted from the filter, and considerable of the solution remains in the filter. There would be little damage if all the funnels and filtering paper were abolished from photographic laboraties. See the advertisement. —Ed.]

Toning Formulæ.

No. 1.

Chloride of gold	1 grain.
Phosphate of soda	18 grains.
Distilled water	8 ounces.

This bath works shortly after it is mixed, or it will keep.

No. 2.

Chloride of gold	1 grain.
Bicarbonate of soda	5 grains.
Water (distilled)	8 ounces.

When it has become colorless, add—

Chloride of lime	1 grain.

This bath will work in an hour or two after it is made, or will keep. Excess of carbonate of lime may be used instead of the carbonate of soda; it is then best made with hot water, but not used until it is cool.

No. 3.

Chloride of gold	1 grain.
Borax	20 grains.
Distilled water	8 ounces.

This bath should be used within a few hours of mixing.

No. 4.

Chloride of gold	1 grain.
Bicarbonate of soda	3 grains.
Boiling water	2 ounces.

In a few minutes add—

Water, cold	6 "

This bath should be used within an hour.

If the prints in any of these baths are required a purple-brown, tone to purple; if a purple-black, tone deep black; if black, to a blue-black. The toning bath should generally be used at a temperature of 60°. If lower than this in winter it should be warmed which may most conveniently be done by placing the dish containing the toning solution in a larger one, and filling the latter with hot water until the desired temperature is obtained.—*Brit. Journ Almanac.*

A New Source of Iodine.

The *Mechanics' Magazine*, speaking of new sources of several rare substances, says :—

"Another interesting example is the discovery of a mineral source of that very valuable substance, iodine. The ocean is the great storehouse of this element, all sea-water containing the iodide of sodium, and iodide of magnesium, but only in such small relative quantity that to extract iodine directly from sea-water is not practiceable, hence sea-weeds, which have the power of attracting it from the element in which they live and assimilating it into their own substance, have hitherto formed the sole commercial source of it. Chemists have been aware of its existence in certain Mexican silver ores, in various land plants growing near the sea, in sponges, and in the oil of the liver of various fishes; but none of these bodies, animal, vegetable, or mineral, contains it in such quantities as would pay for extraction. There is said, however, to have been lately discovered in Chili a mineral consisting of a mixture of iodide of lead with the oxide and chloride of that metal in such proportion as to contain ten per cent. of iodine. This mineral is believed to exist in considerable abundance, and if it really does so, a great reduction in the commercial price of iodine must be a speedy result of its discovery. Such a result would be a great boon to the art of photography, and also to that of dyeing, since the brilliant dye recently discovered by Dr. Hofmann, though the first, will doubtless not be the last, having this element among its constituents."

A Bit of Experience.—No. 2.

BY M. S. ABBOTT.

In the preparation of the silver bath, it is very important that the water and nitrate of silver should be very pure, and no vessel is better adapted to hold the silver solution than those made of glass.

To make a silver solution for negatives, I have found that its strength should be about forty grains of nitrate of silver to the ounce of water. It depends upon the sample of collodion used. If it is very highly iodized, it should be stronger; but if Seely's collodion is used, forty grains will be found sufficiently strong.

I have worked my own bath exclusively for negatives, for one year, at an average of forty grains, and down as low as twenty-eight grains, and produced good results. I do not believe in a very strongly iodized collodion, or a very strong silver bath, for negatives. I have found that a moderately strong silver bath for negatives and a collodion to suit it, works with the greatest uniformity, and produces the most desirable results. I never put any iodide in my bath for negatives, except what comes from the plates immersed, that is all that it requires. I always try to have everything ready, so that my plates do not remain in the nitrate bath any longer than they require to be perfectly coated. I then remove them and drain well, and wipe them over the back and edges before placing them in the plate holder. By doing so I can expose a plate twenty minutes, and not be troubled with stains on my plate caused from the silver solution dripping down, and floating particles of dust, dirt, and other foreign matter. which is immediately sent back at a caterpillar attraction rate, and there is all the trouble which when you come to develope your picture is made visible.

If any one should be inclined to follow my experience they need not go to the trouble of getting a box to carry their plate-holder around the room; but proper attention to your plate before placing it in your plate-holder, will save you all this trouble and expense, and no black spots will appear on your oil carpet. All this silver you see dropped in one place and another, may be retained by using blotting, filtering, or tea paper, to wipe off the silver from your plate before placing it in the shield, and burned to ashes, and with other savings sent to Mr. Seely, to reduce, who by the way gets out as much of the preciaus metal as anyone else, if not a little more. I have tried others, and since April have had between three and four hundred dollars worth reduced, and I now give him the preference. I say this to all who want to know the best way of reducing silver waste or savings. I have tried it myself and have lost as much if not more than Mr. Seely charges for reducing it for me; and one other thing he does I like very much it is done in just one-half the time any other refiner has done it for me.

New York, Jan. 10, 1865.

How to Print on Paper by Continuation or Development; Enlargement by the Solar Camera.

This process corresponds to that by which a picture on the collodion film is obtained; the salts in use are the chlorides, iodides, and bromides of silver. The first impression is made by the agency of light, whereby some molecular, or a chemico-physical change is instituted in the film. This change is invisible to the naked eye, and hence denominated latent; but by the application of other chemical solutions the picture gradually appears, or, in technical language, is developed. The same chemical solutions applied to the film before light has acted upon it, would be utterly inefficacious to produce any apparent chemical change; light therefore, is the prime cause of this wonderful, as yet, inexplicable phenomenon.

Now, paper may be sensitized by the same means, although somewhat modified; and, after exposure, the latent picture is developed in the dark room. This development is thus a sort of continuation of the action already commenced by light. This sort of printing is well adapted for large pictures, as well as for winter operations, and especially for enlargements by the solar camera.

Papers may be salted with a chloride alone, with a mixed chloride and a bromide, or with an iodide.

1.—*With a Chloride—Salting Solution.*

Chloride of sodium (common salt)......	1 drachm.
Hydrochloric acid......................	3 drops.
Rain water..........................	6 ounces.

The papers are soaked in this solution for a couple of hours, and then dried for use. They are now ready for sensitizing.

Sensitizing.

Nitrate of silver	1 ounce.
Citric acid	10 grains.
Rain water	10 ounce.

Three minutes' floating on this solution is sufficient. The papers are then drained and hung up to dry. Exposure beneath a negative in the rays of the sun for three or four seconds will produce a faint image. The print is then developed as follows :—

Developing Solution.

Pyrogallic acid	2 grains.
Citric acid	1 grain.
Rain water	1 ounce.

Take a clean porcelain dish a little larger than the print, and pour in water so as to moisten the bottom; upon this moist surface lay the print, image side upward. By this means it will adhere to the bottom. Now pour over it a sufficient quantity of the developer, so as to cover it rapidly in the same manner as a negative film is flowed. The development is very quick, so that any stoppage of the developer will leave a mark on the the print. As soon as the picture is intense enough, the print is washed in several waters, and afterward fixed in the following solution :—

Fixing Solution.

Hyposulphate of soda	2 ounces.
Rain water	20 "

Keep the prints in this solution until the whites are clear; they are then submitted to the washing operation as usual.

No. 2.—With a chloride and bromide.

Salting Solution.

White of egg	10 ounces.
Chloride of sodium	1 drachm.
Bromide of potassium	1 "
Rain water	16 ounces.

Sensitizing.

Nitrate of silver	1 ounce.
Citric acid	3 drachms.
Alcohol	1 ounce.
Rain water	11 ounces.

Place the papers for three minutes in each solution, and dry them after each operation. An exposure until the image is faintly visible will be about right.

Developing Solution.

Gallic acid	6 grains.
Rain water	2 ounces.
Camphor	a small lump.

Develop the picture at the bottom of a porcelain vessel, as before described, then wash and fix.

Fixiing Solution.

Hyposulphite of soda	1 ounce.
Rain water	2 ounces.

These prints, when washed, may be toned in the gold toning solution.

No. 3.—With an iodide.

Salting Solution.

Iodide of potassium	7 drachms.
Rain water	4 ounces.
Nitrate of silver	40 grains.

Add to this mixture a saturated solution of iodide of potassium until the yellow precipitate is all dissolved.

Float the papers on this solution for three minutes; they are then taken out and floated on rain water for an hour or two, and afterward dried.

Sensitizing.

Nitrate of silver	9 grains.
Acetic acid	20 minims.
Distilled water	12 ounces.

Let the papers float on the bath for three minutes, then hang them up to dry. While the surface is somewhet moist, the paper is placed on a negative or exposed on the screen of the solar camera. Half a minute's exdosure is quite sufficient. The image is latent, and is developed by pouring upon it a saturated solution of gallic acid, containing about one-third its quantity of aceto-nitrate of silver.

As soon as the proper intensity is attained, the print is immersed in water, in order to remove every trace of gallic acid. It is then fixed in the following solution :—

Hyposulphite of soda	1 ounce.
Water	5 ounces.
Chloride of gold	1 grain.

After fixing, the print is washed in the usual manner.—*Towler's Photo. Almanac.*

On the Production of Scarlet Negatives.

BY M. CAREY LEA.

The extreme opacity of a strong red color to the actinic rays of light, renders it peculiarly adapted for negatives. Images of this color may be obtained in the following easy manner.

After fixing and washing the negative in the usual way it is first to be iodized to a bright yellow color. This may be effected in any convenient manner. It may be simply placed in a bath of iodine dissolved in water, or in a solution of iodine in alkaline iodide; or tincture of iodine may be poured over it. This latter method I have tried with advantage, and have since seen that it was first proposed by the Editor of this Journal. Or the negative may first be treated with bichloride of mercury, and subsequently with iodine solution, or both may be applied together in the form of a solution of corrosive sublimate in iodide of potassium.

Any of these well-known methods may be used to produce the iodide. The conversion of the yellow picture to scarlet is effected by Schlippe's salt, the sulphantimoniate of sodium. A tolerably strong solution of this substance is poured over the plate, and moved backwards and forwards till its action is uniform. The color produced varies slightly in shade; when the operation has been properly performed, a brilliant scarlet color is obtained.

The red coloring matter which gives the scarlet tint to the picture is probably the sulphantimoniate of silver, a substance of sufficient permanency to justify its employment, especially as it is to be further protected by varnish. The instability of the mercury compounds now so generally used for strengthening negatives, is a strong argument against their use and in favor of the substitution of anything that promises greater permanency.

The scarlet image thus obtained may be again modified by new treatment. An ammoniacal solution of nitrate of silver brings it from a scarlet to a purple color. This I mention merely as a matter of curiosity, the advantage being manifestly in favor of the first color.

While on the subject of strengthening negatives, I may refer to one or two points on which information might be advantageously elicited. The most opposite opinions are entertained with respect to the comparative permanency of the methods now in use. Mr. Lamb in a communication to Sutton's *Notes*, (1861) mentions that he had been for a long time in the habit of using bichloride of mercury followed by iodine, but that every negative so forced had faded in two or three years. Bichloride of mercury followed by alkaline sulphide is largely used, and gives very strong pictures, but a professional photographer who makes a specialty of copying, and forces most of his negatives, informed me that he had abandoned that treatment in consequence of the instability of the picture. No one who works carefully wishes to make negatives of doubtful permanence, and as copies of pictures and engravings, instantaneous views, etc,, must often be strengthened, the question as to what is the best means of forcing is one of very great importance. Correct information from those who have old negatives which have been treated in the various ways referred to, would be valuable and would aid in building up a firm foundation of knowledge in this branch of photography.

With respect to the process which I have here described, and which I believe to be entirely new, one or two remarks remain to be made. Schlippe's salt, the use of which I propose to introduce, has the representation of being extremely unstable. Although this has nothing to do with the picture produced by it, inasmuch as the salt undergoes decomposition in forming it, it is nevertheless of interest in connection with its use. The Schlippe's salt which

I have been lately using, I made myself some *ten years* ago in order to study its very interesting crystalline forms, and I then ascertained that its stability might be greatly increased by the use of a somewhat larger proportion of caustic soda in preparing it, than that directed by the formula of Liebig. No better proof of this is required than the fact that what I prepared in this manner, after remaining for ten years in a bottle not a quarter full and merely corked, not sealed, is still good.

As Schlippe's salt is not everywhere to be had, and as many photographers may desire to prepare it for themselves, I give the following directions, based upon the conclusions just referred to.

Place in a closed vessel the following mixture, viz.:—

Grey sulphide of antimony	22	parts.
Crystallized carbonate of soda	44	“
Well burnt lime	17	“
Water	48	“
Flowers of sulphur	4	“

The lime is slaked with the water, and the whole is then mixed in the vessel, 140 more parts of water added; a large bottle is best, corked, and well shaken from time to time. At the end of twenty-four hours it is filtered, water poured on the filter, to carry the soluble parts through, and the filtrate is evaporated to the crystallizing point. An abundant crop of large lemon yellow crystals of beautiful forms (regular tetrahedral) is obtained. These should be dried and secured in a well closed bottle. They are less permanent in solution, a ten per cent.solution will however keep for some days; in proportion as thesolution is weaker, it becomes less stable. When very dilute it soon lets fall a reddish powder. This is an objection to its use in a dilute form as a bath which neverthelesss in other respects is preferable. The solution should be kept for a few minutes on the plate. As the materials for producing this substance are inexpensive and the manipulation of the easiest kind, it could be produced commercially in case of an extended demandat a price scarcely exceeding that of hyposulphite of soda.

It has occured to me from observing the effect of some negatives made in this way, when viewed as positives, that a treatment of this kind might be found to produce an agreeable effect in giving a warm tint to ambrotypes. I have not however made any experiments in that direction, and merely throw out the suggestion.

The final tint which the negative has when treated in this manner, appears to depend very much on the extent to which the previous iodizing has been carried. If the application of iodine has been but for a short time, the resulting negative after treatment with Schlippe's salt, will be of a beautiful russet brown, a shade unlike anything that I have seen in photography. As the extent of the iodizing increases,so will the warmth of the resulting tint at the end of the work. With a nearly sufficient continuance, an orange color is produced—but when the iodization is complete, a full scarlet results. The orange color I like less than either the scarlet or the russet brown, and I am inclined to believe it in the present less impervious to light than either of those shades.

It seems almost superfluous to remark that to apply this treatment to a negative already nearly strong enough—especially to a view negative, would be to commit a gross error. The result is that the lightest half tints become too thick and print white, giving that snowy effect which is so repulsive.

Its use, like other strong modes of forcing, must be reserved for bringing up very thin negatives, or for strengthening engravings in which it is desired to keep the lights absolutely white even through a long exposure, and like other powerful methods, great care must be taken that it does not block up the most delicate lines.

In preparing Schlippe's salt, the process may be very much expedited by heat. The materials may be placed in a large flask and boiled together for two or three hours. The test of the completion of the operation, whether heat is used or not, is that the grey insoluble powder at the bottom, becomes white.

The keeping properties of a solution of Schlippe's salt may be greatly increased by rendering it alkaline, for example, with a few drops of ammonia. But the brilliancy of the color produced is thereby greatly impaired. So too, the mother water from which the Schleppe's salt has crystallized out, may be used. This produces a sort of deep red-black picture very opaque to the active rays. In fact it has occurred to me latterly that when it is merely wanted to produce an effectual strengthener, and a scarlet color is not especially sought for, it is scarcely necessary to crystallize the salt.

This materially simplifies the operation. The ingredients already mentioned might simply be placed together in a large bottle, and set aside for a day or two until the whiteness of the insoluble portions indicates that the whole of the grey sulphide had been decomposed. It then might be simply filtered and placed aside for use. This liquid would doubtless keep well. I have not tried it, but as the mother water after crystallization does, it can scarcely be doubtful that this would also. I must repeat, however, that if a scarlet color is desired, the crystallized Schlippe's salt must be employed.

I directed in ths foregoing part of this paper, to flow the plate with the solution of the salt. But I latterly prefer to use a rather weaker solution, or to drop the plate into a sufficient quantity to cover it, placed in a porcelain dish.

It is now fifteen months since I first found and used this method, and the negatives then made are still in excellent condition, so that, so far as experience has gone, it is in favor of their permanence. As however I have had little time for printing, none of my negatives have been exposed much to the sun, and I cannot therefore speak positively of its effects. Generally, however, the sun does not injure strengthened pictures.

There exist various compounds of a nature analogous to Schlippe's salt which would doubtless produce results very similar to it. The sulphantimonite of sodium, for example, would probably afford a very similar coloration. So, too, the various compounds of arsenic, sulphur, and alkali, alkaline hyposulpharsenite, sulpharsenite, and sulpharseniate. The reactions of these substances were not examined as there seemed no reason for expecting better results from them than from the sulphantimoniate, which is more easily prepared and less poisonous.

In conclusion, I may remark that while a proper proportion of caustic soda is essential to the stability of the salt, an excess would be likely to be very injurious: the proportions I have given may be used with advantage. Red stains on the hands and on vessels occasioned by the use of this substance, are easily removable with weak caustic alkali.

PHILADELPHIA, Pa., Jan 2nd, 1865.

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The Dead Eye Again.

Perhaps the wit of man is unable to contrive a story so absurd that it may not find honest and zealous believers. It is only necessary to connect with nonsense some mystery of life or death, and it commends itself to the faith of certain minds which are regarded as sound and respectable. There are indeed those who are sceptics on all matters except those which they do not understand. Witness the monstrous doctrines which have sometimes prevailed in religion, politics, and medicine; and such are even now so prevalent that if we were to name illustrations, some of our readers might find a favorite hobby among them.

The dead eye stories are without doubt only ridiculous to photographers, and to people of good judgment who have a smattering of knowledge of optics and physiology. But that there are many other people in the world is sufficiently evidenced by the fact that the latest dead eye *canard* has gone the rounds of the press, and is seriously commented on everywhere. One of our city papers, *The Police Gazette*, illustrates the scene of photographing the dead eye by a large engraving, and many of the papers have found it worth while to treat of the subject editorially. As a sample of the editorials, we reproduce the following from the *New York Herald* of the 6th inst. :—

"Photography as a Detective—Its Judicial Application in Italy.—We publish to-day a curious and interesting statement relative to a new and important use for photography, and one which may eventually form an important part in criminal investigations. It seems that the eye of a murdered woman has been magnified and photographed in Florence, Italy, and found to represent what is regarded as the profile of a human face resembling that of her supposed murderer. It is true the testimony in favor of the alleged resemblance is not sufficiently positive to hang a man, but the opinions of such distinguished men of art as the great American sculptor, Hiram Powers, and others, upon the subject, are such as to add weight to the supposition that the likeness is actually that of a human being, and, perhaps, that of her assassin. Further investigation, it is expected, will confirm this theory. This idea of photographing the human eye for the purpose of ascertaining whether it retained a certain object is not entirely new. During the investigation of the mysterious Burdell murder in this city the theory was broached, and some steps taken to ascertain its correctness; but we believe nothing came of it. It now assumes shape and consistency from this Italian murder, and our scientific men are, therefore, justified in pursuing their examinations until the soundness or falsity of the theory be established. In this age of wonders we should not be at all surprised at any discoveries in the world of science. Photographs and daguerreotypes have already been important auxiliaries in the detection of criminals, and when the "tell-tale eye" shall be submitted to the same process and found to mirror the features of an object like that of the human face, truly the day will arrive when the pirate's maxim, "dead men tell no tales," shall cease to have a meaning. The telegraph, the railroad, daguerreotypes and photographs are now the chief aids of criminal detectives, and the time may not be far distant when the Christian world may have to rejoice upon the suppression of crime, in a great degree, mainly from the certainty of detection."

Editorial Department.

———We have had the pleasure during the past few days of verifying by actual trial Mr. Lea's process of producing scarlet negatives; our first favorable impressions were more than confirmed. We have had nothing in a long time which was so novel and so surprising. It is likely to have a permanent place in the photographers repertory of good things. Schlippe's salt, so far as we know, has never before been named in connection with our art. Its happy introduction by Mr. Lea will no doubt lead to uses of it in ways which are yet unthought of, and will draw attention to a large class of substances for which no use has hitherto been known. Subscribers will please read the article on Scarlet Negatives. and thus be prepared for the process pedlars who will follow in its wake.

——The meeting of the Photographical Society held on the 12th inst. being the annual meeting, the domestic business of the society claimed the chief attention; a few matters of general interest were however noticed. In the next Journal we shall give the usual report This was the last of the meetings at the University. The Society will immediately remove to its permanent premises, on the corner of 20th street and Broadway. It is expected that by the second Monday in February the new meeting room will be tastefully decorated with many of the fine photographs, which hitherto have scarcely seen the light. Arangements will probably be made for opening the place for the accomodation of members and their friends at other times than at the stated meetings. In a little while we anticipate that every photographic stranger who shall chance to be in the city will not be willing to go away without visiting the Society.

——Mr. Hill the subject of the following notice was the gentleman who gave origin to the word "Hillotype." The notice appeared as below in several of the daily papers :—

HILL.—On Tuesday, Feb. 7, Rev. LEVI L. HILL, aged 48 years, 11 months, and 12 days.

The relatives and friends of the family, and also the members of Park Lodge, F. and A. M., Union Chapter R. A. M., Manhattan Commandery K. J., and the Masonic fraternity in general are respectfully invited to attend the funeral from his late residence, No 439 West 47th st., on Friday, at 2 o'clock, without further invitation. Hudson, Catskill, and Kingston papers please copy.

Minor Correspondence.

J. M. E., of Ky.—" I am about to open a new room, and want your advice about the light. I can put in either a north or south light. and want to know whether the work done by the south light is as well done as by the north, a and which you would advise?" ....We still prefer and recommend the light facing the south. It is somewhat more variable than the north light ; but a little experience will teach one how to manage it. The south light should be so arranged that any screens of blue or ground glass can be removed when the sky is overcast.

J. C. D., of Ill.—" Find enclosed a specimen picture which seems troubled with some disease, I send it to the doctor therefore. I have been troubled repeatedly with such markings. The picture was perfectly *clear*, and the whites as pure as could well be for an hour after it was fixed, and until it had been changed in *five* different waters, when it suddenly with many others became marked, What is the matter? I attribute it to hard (surface) water. But if that be so why should it attack only some and not all and mostly vignettes? What are the markings on the back of the print, have often noticed them but as no harm results from them I never enquired. I had about two pounds of old collodion this fall which had become perfectly red, thin, and worthless. To experiment, I put into it the most of a box of old gun-cotton, let it settle, and poured off the clear, then agitated it for a few days with re-distilled mercury, until the color was a dark lemon, decanted, coated a plate, exposed and developed the finest negative I ever saw, and it still works with the best results, so far as intensity, etc., is concerned, but with this slight drawback, every film upon drying cracks into millions of fine checks. I have tried coating with gum water. etc.; can you suggest anything? I want to know if the 'opal pictures' are not a humbug? I judge so from the price they ask for specimens. I hope you will not fail to give us the first information in regard to the new discovery as to producing 'non-actinic rays' without thickening the image. This is the thing most wanted and I believe quite feasible. What will a good microscope suitable for focussing purposes cost me, and can I get one by mail? Your Journal is valuable, and yourself trebly so, so long as you continue to answer questions, at any rate." ....The opaque or yellowish markings in the print are signs of insufficient fixing They can be seen on coming from the hypo, and become more apparent after drying. ..We have observed the splitting up of the film in new collodion as well as in old It is dependent upon the gun-cotton. ..The opal pictures are by no means a humbug. They are expensive however, chiefly on account of the cost of opal glass. ..A good focussing glass costs from $3 to $5. They are too heavy for mailing. ..We have heard nothing of the new discovery. Read Mr. Lea's article in this number.

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[NEW SERIES.]

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Streaks on Negatives in the Direction of the Dip.

At the request of some correspondents who seem lately te have been much troubled with this blemish in their negatives, we resume the subject, for the purpose of treating it more elaborately than we did in the short article of last week. The defect in question seems, from what we have heard, to be more prevalent than we imagined, and as it is one which occurs under a great variety of circumstances, to an examination of which we have recently given renewed attention, we think it an opportune occasion to give the subject something more than a passing notice.

Supposing the operator to be working with a good bromo-iodised collodion. the condition of the nitrate bath will be found the principal source of these streaks in the direction of the dip. Other sources no doubt exist, but we have not space to particularize them at present. We shall only mention four peculiarities of the sensitising bath, all of which we have found very conducive to their formation. The discussion of these will afford ample material for this article without going beyond the information derived from our own experiments.

The sources alluded to are—1st. Condition : *Alkalinity of the bath.*—2nd. *Over acidity.*—3rd. *Accumulation of organic matter.*—4th. *Depression of temperature.*—It will be observed that we have here given the third different from that mentioned in our short article of last week. But from some experiments, which will be referred to presently, we hove seen occasion to alter our opinion as to the alleged effect of ether and alcohol in facilitating the production of streaks, and we are now inclined to ascribe the result to organic matter, which, in old baths, always accompanies the others.

1st. *Alkalinity of the Bath.*—Not only does an alkaline bath (or a neutral one, with colorless collodion iodised with salts of cadmium) produce a general fogging of the film, on the application of the developer, but also lines of deeper intensity in the direction in which the plate was first immersed in it. In no case, so far as we have observed, do these lines occur at right angles to the line of the dip. They are always coincident with that line, or cut it at a very acute angle. Hence we conclude they are due to some cause only operating in the same direction.

In this case the indications of general fogging accompanying the other defect must not be taken as disclosing the true cause of either, for they may originate from two other states of the bath, which we shall presently explain. If the symptoms are as above described, litmus paper will enable the operator to discriminate between them and to apply the proper remedy. Immersed in the bath, the paper should change from blue to slightly red in the course of a few seconds. If it does not do so the solution must be acidulated till it acquires that power, when probably all will go well, and the streaks and fogginess disappear siultaneously.

2nd. *Over-Acidity.*—The action of an over acid state of the bath often, but not always, exerts an effect on the developed plate similar to the above. It is more liable to do so if the acidulated agent be acetic or any other organic acid; although we have sometimes observed it when too much nitric acid has been added. But in the latter case the streaks may, perhaps, more properly be ascribed, in most instances, to an excess of organic matter. More experiment is needed to settle this point.

When marks of this kind arise from acidity of the bath, they present pretty much the same appearance as those previously described, viz., general fogging accompanied with parallel lines; but the intensity of both is less than when the bath is alkaline. Here, again, litmus paper is useful. If, after immersion in the liquid, it instantly turns red, the operator may be satisfied he has found out the true reason, and should at once apply the antidote.

A very convenient method which we always employ for neutralising and acidifying nitrate baths, was described by us at page 283 of the last volume, to which, for details, we refer our readers.

It may be remarked, generally, that streaks in the dirction of the dip are the usual concomitants of slight fogging, by whatever means the latter may be caused. In some instances the lines are narrow and close together, in others broader and further apart; and these varieties often occur without any seeming reason for the difference, while working with the same bath and the same collodion.

3rd. *Accumulation of Organic Matter.*—From some experiments lately performed, we are induced to think that ether and alcohol in the bath do not, by themselves, possess any action in encouraging the formation of streaks. In baths which have been long in use, and which, therefore, contain much organic matter, there is, at the same time, collected a considerable proportion of ether and alcohol; but it would seem from the experiments we are about to record that it is the organic matter only which acts prejudicially.

To ten ounces of a freshly-prepared thirty-grain solution of nitrate of silver, acidulated to the requisite degree, and not quite saturated with iodide, two ounces of mixed ether and alcohol were added, and the whole well shaken up. The trough containing the solution was placed for a few hours in a room at a temperature over 50° Fah. A collodionised film excited in it showed no sign of streaks after development, although the plate was not once moved in the bath till its final removal.* Another bath alongside of it strongly impregnated, not only with ether and alcohol, but with organic matter from long use, yielded them abundantly on a plate coated with the same collodion.

So far as they go, these experiments seem to show that ether and alcohol in the bath at least do no harm; and, if the mechanical theory of "streaks" be correct, there is reason to believe that their presence would rather be beneficial than otherwise, because they would enable the aqueous solution in which they are mixed to combine more readily with the repellant surface of the ethereal compound of pyroxyline. The supposition is slightly confirmed by another experiment, in which two ounces of ether and alcohol were stirred up in a bath containing organic matter. Although this addition did no remedy its streaking propensities, it did, as far as the eye could judge, to some extent diminish their intensity.

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* When developing plates sensitised in solutions containing ether and alcohol, care must always be taken to discriminate between lines occasioned by the uneven spreading of the developer and those produced from the irregular sensitising action of the bath. In all cases where baths are so contaminated, the developer should be mixed with one-fourth of its bulk of alcohol, which will permit a perfectly even action of the iron or pyrogallic solution by bringing it in instant contact with the surface of the film.

In the first bath referred to—viz., the pure solution, in which ether and alcohol had been shaken up—three chlorised albumen plates were sensitised consecutively. This was with the object of contaminating it with organic matter. A collodion film was then dipped in it, exposed, and developed. There was now considerable fogging, and the streaks were well marked, although the bath had worked satisfactorily before the albumenised plates were immersed in it.

We have not yet had an opportunity of confirming these experiments, and comparing them with others made with different solutions and under different circumstances; but they evidently point to one great source of lines in the direction of the dip, which does not appear to have been hitherto recognised. The manifest remedy is to eliminate the organic compounds which originate them. This may be done by sunning the solution.

4th. *Depression of Temperature*—Another source of lines on the negative, occurs, as already stated, when the bath may be otherwise in good condition. If the temperature of the nitrate solution be allowed to fall to about 35° Fah., they are very liable to be developed on any collodion. Some kinds—those of a horny character, for instance—are more subject to them than others; and with all collodions it is more likely to take place and be more strongly marked, if the film has not been allowed to set well before immersion in the bath If the temperature rises to 45° Fah., or upwards, there is little danger of their production. In appearance they differ from those already described. There is no general fogging of the film, as in the others, and, while the plate remains clear and brilliant in other respects, the only observable peculiarity is broad lines of more intense development, which, however, still retain the transparency which should characterise the deep shadows.

Mr. Davis stated that they may be seen by a tolerably bright light before development. We have hitheerto failed to recognise them, and we have also attempted to watch their formation in a transparent trough without success. They are, doubtless, there, and possibly by keen eyes may be faintly visible. We only state our own experience. We have, however noticed the following fact, which may give some clue towards explaining the phenomenon :—It is well known that the surface of a collodion film, when raised from the nitrate solution very soon after it has been dipped, presents a series of little streams of liquid flowing downwards which do not coalesce. A plate in this condtion was held over the bath for a short time, and marks were made in several of these streams with a silver pin. The plate was then replaced in the bath and allowed to remain until fully senstised. It was afterwards exposed and developed in the usual way. After fixing, through each of the pin marks a line of deeper development was distinctly visible, running in the direction of the previously marked stream.

The methods of preventing streaks arising from depression of temperature lie, either in raising the temperature of the bath solution, or in moving the plate—say for thirty seconds—backwards and forwards, with a slide movement, immediately after its immersion, but on no account should it be raised out of the bath till after the lapse of some time.—*Brit. Journ.*

How to Take Vignette Negatives in and out of the Camera—Old and New Processes.

BY J. WERGE.

A PROVISIONAL specification for a "New Vignetting Camera," having been recently filed, I was somewhat surprised on reading it, to discover an attempt to secure a monopoly of a thing as old as the days of daguerreotyping, and I published a kind of protest against it in the form of a "prior claim" on the ground of "previous knowledge;" and as that protest brought out two other "claims," I have thought it would be advisable to draw up a sort of history of the various modes of vignetting in and out of the camera, with which I have been acquainted and have practised for many years

I was induced to do so with the view of showing how absurd it is for anyone now to attempt to patent so old a process. And to prove that I was previously familiar with all the characteristics of such a camera as that claimed by Mr. Mac Nicol as "his invention," and also, that by Mr. Sarony, I know not how old the idea of vignetting in the camera is, nor do I know who first conceived the happy thought; but such as I have, I shall willingly give, and with equal pleasure the names of those to whom credit is due.

The first method of vignetting in the camera which I remember consisted in obtaining a vignette on a *black* ground, by placing in the camera a diaphragm, between the lens and the plate, so as to intercept a portion of the rays coming from the sitter, and produce a vignette of a form corresponding with that of the diaphragm.

In the second plan with which I became acquainted, a vignette was obtained on a white ground. The plate was exposed in the camera as in the former process; and, before developing, a piece of glass with a black disc in the centre, or thereabouts, was placed before the plate, which was then exposed to diffused light for a second or two, the disc protecting that part of the plate which had previously been exposed to the sitter. As a matter of course, the resulting picture was a vignette on a white ground. The idea of covering the head with a disc, and exposing the other part of the plate to diffused light is due to Mr. Mayall, who, if I mistake not, published the process in 1849 or 1850. At any rate in 1850, I produced vignetted daguerreotypes in that way, after Mr. Mayall had published his method.

A third method of obtaining a vignette direct in the camera is as follows :—Between the sitter and the front of the lens a white or light screen, with a hole in the centre, was placed so that the sitter had the appearance of sitting behind a large white frame. The edges of the whole being jagged and out of focus, the result was a very soft and pleasing vignette effect. Sometimes the sitter was placed against a light background, and a *half* screen of the same color as the background, placed between the sitter and the camera, the edges of the screen being of a cloud form, the vignette effect was very good. This would be improved by *suspending* the rcreen from the roof of the operating room, slightly agitating the screen while exposing, to obtain increased amount of softness

Who was the author of this process, I really do not know; but it is very old, for I first saw it practised by Mr. Cady, in New York, in 1853.

Fourth plan.—Another method, of whose parentage I am also ignorant, but which I first saw employed by Mr. Bushnell, of Philadelphia, in 1854, consists in placing the subject against a light background, with a *shaded,* or darkened centre, and then with a large hand screen of the same color as the light part of the background, cut off the lower part of the figure. The hand screen being of a crescent form,‘and moved about by the operator during the time ef exposure, the form and quantity of the vignette was entirely under his control. By this mode of working, very soft and artistic effects could be produced.

Fifth.—Another and simpler method of obtaining a vignetted negative direct in the camera, is to take the picture on an ordinary vignetting·glass at once.

This plan has been very successfully practised by Mr. Earnest Edwards.

Sixth.—One more very simple way to vignefte a negative, is to take any ordinary negative and coat the back of it with Aldis's non-actinic varnish, and before the varnish is dry, take a pellet of cotton wool, and wipe off the varnish from behind the head and as far round as you wish. By this means any form of vignette and any amount of softness may be obtained, and any artistic effect you may desire, can be easily produced. Where large numbers of prints are required, as from publication negatives, this, or Mr. Edward's mode is probably the best that can be resorted to.

In conclusion, I will describe the "vignetting camera" I ordered to be made nearly three months ago. It is to be an ordinary carte de visite camera, with a diaphragm of glass, wood, cardboard, or metal, in the body of the camera, as described in the first of the six processes I have detailed. After the plate has been exposed to the sitter through the aperture, the diaphragm is to be removed, and a glass plate with a disc in the centre or thereabouts, or an ordinary *positive* vignetting glass put in its place by means of a slide and groove in the camera. Then the plate is to be exposed again through the lens to a white screen placed before the sitter, or after the sitter has gone away, the disc or positive vignetting glass protecting that part of the plate which was previously exposed to the sitter. This is the camera which Mr. Mac Nicol claims as "his invention," and which is very similar to the one described in Mr. Sarony's provisional specification. But, as you will observe, it is only a combination of the first and second processes I have described, and which were known to almost every Daguerreopist in England and America, long before the collodion process was heard of. I should think after this, both Mr. Sarony and Mr. Mac Nicol must consider their claims to originality of "invention" or "improvements in this direction," rather weak and untenable.

[We may add to this interesting note on vignetting systems one with which Mr. Werge as an old Daguerreotypist is doubtless familiar, but which has possibly escaped his memory. We practised the method to which we refer twelve years ago, having first seen it in America in 1852. It is only applicable to Daguerreotypes. It consists in covering the plate after exposure with a mask of wood having an oval aperture in the centre, the edges of which were bevelled in a fashion similar to the old French passe partouts. The plate was then submitted to the fumes of the mercury for development. Where it was protected by the mask, no development took place, and the partial development produced by the vapor creeping under the bevelled edges of the aperture, graduated the tint from the white of the background to the black of the margin. On page 104 of the *Photographic News*, vol. iv., we gave a diagram of a screen with a serrated oval aperture, which, placed midway between the camera and sitter, vignettes the negative in a manner similar to one of the methods described by Mr. Werge. We have produced excellent result by the method we then described.]—Ed. *Photo. News.*

[Our readers who were daguerreotypists without doubt, will remember how common and popular vignette daguerreotypes were; the above processess will be recognized as familiar acquaintances. If our recollection is correct, the vignette pictures were first called crayon daguerreotypes, and were made by one of the above processes, which was covered by a patent. The parade made of the patent stimulated invention in the same line, and the whole subject was soon exhausted. To American artists is wholly due the introduction and perfection of the art of vignetting photographs.]—Ed., Am. Journ.

Miscellaneous Photographic Hints.

BY M. CAREY LEA.

Copying Ambrotypes or Collodion Positives.—The recommendations usually given in the text-books, are to execute this species of work either in direct, or reflected sunlight.

Having recently had occasion to copy an ambrotype, which was rendered particularly difficult by the necessity of getting details in masses of thick black drapery, in which the details were barely visible on the picture itself, at the same time that there was danger of getting too much density in the face which was rather destitute of shading on the original, I made several careful negatives in the sunlight, and several in a strong diffused light. I found that in the latter way, by giving a long exposure, and putting an additional quantity of acetic acid in the developer, I obtained more detail in *both* the high lights and deep shadows, than where the work was done in direct sunlight.

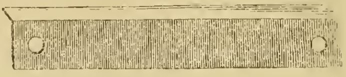
And in this connection, a remark suggests itself, which obvious as it is, I have never seen in any manual, and which may be valuable, especially to amateurs whose means of regulating light are not apt to be so good as those of professional photographers.

If you are copying either an ambrotype or a daguerreotype, and your light comes in chiefly from the side, *invariably* place your original in a horizontal position, that is, on its side. But if your light comes principally from above, then place the original vertically, that is, head uppermost.

For if there is any difference in the illumination of your subject, it is better that it should vary between the top and bottom, than between the sides. A slight difference in the illumination of the two sides of a picture, immediately strikes the eye, and spoils the effect in a copy, whereas a difference in the other direction is comparatively unimportant.

Preserving Journals.—I have lately made use of a contrivance, which, simple as it is, has afforded me so much convenience and satisfaction, that I propose to describe it here for the convenience of those who may have felt the need of something of the sort. Every one who is in the habit of receiving journals, whether photographic or otherwise, experiences the annoyance of not knowing what to do with them until they can be bound. The consequence is that either they are tossed pell-mell upon a shelf, or else are tied up in bundles, which must be untied whenever it is desired to refer to one, and in that reference the order of the whole is apt to be disturbed, and when they are next wanted, they must be again sorted into their series.

Having myself experienced the utmost annoyance from this source, I devised a *temporary binding* as follows: a narrow piece of tin about six inches long is bent lengthwise at a right angle, so that one side shall be about 6 × $\frac{1}{2}$ and the other 6 × $\frac{1}{4}$ inches. On the underside a hole is punched near each end. The piece then has the appearance represented below. The numbers of the



journal are arranged in proper order, and then with an awl two holes are punched corresponding with the holes in the tin. The tin is then laid along the edge and a piece of tape with a tag at each end is passed first through the tin and then through the holes punched through the journals; another tin in a reversed position is placed at the bottom, the tape is passed through the holes in the second tin and then drawn tight and tied fast. The journals are thus held together almost as solidly as if actually bound, and open at least as easily and as freely. The great advantage lies in this, that it is easy to untie the tape, remove the tin at the bottom, and add the fresh numbers as they come. Thus one's journals are in just as convenient condition to refer to through the current year as when actually bound. In fact the arrangement is so satisfactory that one scarcely feels the need of having them bound at all. To make the tins more pleasant to handle I have them japanned.

Wothlytype.—The last number of *Humphrey's Journal* contains a letter from Mr. N. M. Griswold, who claims that he has been in the habit of using collodion as a vehicle for sensitising materials applied to paper for six or seven years and that he shortly means to make public a process which he thinks will be found far superior to the Wothlytype. He asserts also that he is able to prove that he has used collodion in this way for thetime mentioned, anp otherwise impugns the novelty of the Wothlytype.

In reference to the last named process, it is certainly a mistake to allege that the paper is more easily prepared than by the ordinary method.

For us a good albumenised paper is always attainable at moderate rates, it is certainly less trouble to float on the positive bath, than to lay sheets on glass and collodionize them, in which latter case the difficulty of obtaining perfectly uniform covering is sufficiently apparent. Should it be found that the use of collodion has any marked advantages over the other processes, it will probably prove best to fill a vertical bath with the collodion, and to dip the sheets into it. This method would I think be simpler, quicker and better than that now used.

Fogging.—In a recent letter on the subject of tannin plates Mr. Himes mentions a rather striking and ingenious experiment, from which however an interesting conclusion may be drawn, in addition to those which he deduces. He exposes one-half of each of two tannin plates for a moment to diffused daylight—exposes one in a camera to a view for a minimum time, and the other for a period five times as long. The first plate having had a minimum exposure, requires an energetic developer, which instantly brings out the fog caused by the momentary exposure to daylight. The other negative which has had a prolonged exposure admits of the use of a very weak developer, and a light, clean negative is obtained, free from fog, notwithstanding the exposure of the plate to diffused daylight.

This is a clever and ingenious experiment, and leads to the remark, not made by the author, that, so to speak,—*we want the fog.* To speak less paradoxically, we want to obtain all the faint impressions of light and the experiment would go to prove that, that is best accomplished by an energetic development. It also explains why a better picture is obtained when the first development is sufficient without re-development. It shows also why an iron development affords more detail than one by pyrogallic acid. The greater energy of the iron salt brings out the fainter impressions of light.

Yellow Coloration of Faded Prints.—Davanne and Girard published an explanation of the yellow coloration of faded positives based on the fact that sulphuretted hydrogen throws down a yellow and not a black precipitate from solution of silver mixed with organic matter. I showed that the yellow color was due, not necessarily to the formation of an organic compound, as concluded by them, but to the extremely fine division of the sulphide of silver, and demonstrated this by precipitating silver from very dilute solutions, by sulphuretted hydrogen, and also by hydrosulphate of ammonia, when, with solutions sufficiently dilute, I obtained the same results whether organic matter was present or not. Dr. Vogel in quoting these experiments, supports the views expressed, from another source, by showing that finely divided sulphide of silver is yellow. By exposing a piece of clean silver to the action of sulphuretted hydrogen, the first coloration is yellow, and it is only by a longer exposure to the action of the acid that the silver is blackened.

Philadelphia, Pa., Feb. 2nd, 1865.

Preservative Plates.

BY M. MARION.

The preservative frame for sensitized plates by the dry process retains the usual form and construction, only on the upper portion it has an aperture to admit the passage of the sheath frames which we call preservative portfolios, and the lower strut of the frame is adherent to the shutter.

With a few portfolios, which are not at all cumbersome, we can, during excursions, carry a number of plates previously sensitized without augmenting the photographic baggage; the changing of the plates in broad daylight is effected without the least difficulty.

With the exception of a few modifications, and improvements, the principle remains the same as that we described in 1855 for the dry paper process.

The pressure-frame, which, as we have stated, retains the usual form, has its shutter furnished on the interior with a spring intended to press against the glass, and to retain it immovable in the zinc border upon which it is placed and covered with a screen; it is then introduced into the sheath itself, a trifle longer than the frame, is introduced into the latter, and thus projects at the upper aperture of the frame.

The glass slide, larger at its base than the sheath, exceeds the latter in length and breadth; it is by this projection that it slides in the grooves of the wooden frame; so that when the sheath is displaced under the effort of the finger, which draws it upward the slide remains immovable, and ready for the exposure in the camera.

Strictly speaking, with our preserver, we can suppress the shutter; of the printing-frame; for the preservers themselves act as shutters but a double guarantee has its advantages, and we must at least retain them in such especial cases as where we desire to have a frame of very limited dimensions.

We have arranged our preservative portfolio in such manner that we can operate in the camera with the collodion film either before or behind the plate.

The same frame that serves to operate, serves also for focussing. The ground-glass placed in a zinc frame, is introduced through the upper aperture, the ground side before or behind, as may be desired. If we wish to act upon the collodion film in front, we focus by placing the glass with the ground side foremost. If, on the contrary, we desire to act upon the collodion film through the thickness of the glass, we focus on the ground side of the glass, turned inwards, facing the operator. It will be understood that in either case, while focussing, the shutter of the frame must be kept open.

We have arranged our preservative frame to operate in two ways, in order to respond to a want sometimes felt of having the negative picture in its natural direction; in order to obtain the same, when in the positive frame, we print the sensitive paper through its thickness, as recommended for the carbon process.—*Bulletin de Photo.*

Another Permanent Printing Process.

We have received from Mr. Deltenre Walker, of Brussels, some specimens of another printing process for which a claim of permanency is made. They are produced, it is said, by means of a salt of iron, and gold or platinum, but in a manner different to any hitherto published, the invention being due to M. Esselens, described as a distinguished chemist. The process is probably based upon the Chrysotype process of Sir John Herschell, in which a persalt of iron is changed into a protosalt by the action of light, and thus acquires a power to reduce gold, platinum, &c.

The prints we have received are described as the imperfect results of a first trial, and are not to be criticised as pictures, and they are, moreover, reproductions, which are not the most favorable for affording a fair estimate of a process; we will not, therefore, at present, enter into further discussion of their pictorial qualities, than to state that they are vigorous and clean, with pure whites, and shadows varying in color; one is a blueish-green, another of a lavender tint, and a third of a rich purple. It is probable that the process will be patented in this country, and we shall then probably, if not before, hear something more of it. In the meantime we append the statement of claims made for the process.

1st. The permanency of the image, which is composed of pure gold, or of gold and platinum.

2nd. Economy, by the omission of the salts of silver replaced by gold in a minute quantity, the expense being reduced by more than three-fourths; ordinary paper and common water are also employed.

3rd. Economy in time. A washing of a minute or more replaces the toning, fixing, and the six or eight hours of washing necessary in ordinary printing.

4th. Color that by ordinary photography cannot be imitated; and the applicability to a great number of purposes not at present readily available in photography.—*Photo. News.*

Pinholes.

BY E. BOOKHOUT.

Mr. Editor—I send you a few lines, which, if you think would be of any use to young photos, you can give them the benefit of.

In guarding against the appearance of pinholes, it is acknowledged that the sediment at the *bottom* of the collodion should not be stirred up, but I have never read nor heard that we should be equally suspicious of the *top* of the collodion. I find, however, in practice, that the first negatives made from a bottle that has been settling for a number of days have had pinholes when the others have been free from that plague; and on examining the top of the collodion with a magnifying glass, moving the bottle a little at the same time, a cloud of whitish-looking powder, can be distinctly seen. I have seen it with the naked eye. My remedy is, always to pour a little off into a long sample bottle, and when the bottle is full the good can be saved.

NEW YORK, Feb 17, 1865.

Helioaristotypia.

THE following amusing extract from a letter from Mr. Helsby, respecting his new method of printing upon enamelled white glass, will no doubt interest our readers :—

"I have a large collection of Daguerreotypes which I flatter myself, should you see, you would regret with me that so beautiful and sterling a process is doomed to be forgotten. Such are the ways of this world. What have we not had that has passed away perhaps never to return?

"It is indeed very gratifying to me to find my opinions of my new portrait expressed in the name 'Helioaristotypia,' endorsed by so able an authority as yourself. It is almost needless for me to tell you, that I have not jumped on this picture all of a hop. It has cost me much hard cash, hard study, and hard thinking and working too. For the present, I am sorry I cannot post you up on the process.

"The specimens seem to have been universally admired by all who have seen them in London. The day before yesterday I sent eight more for Exhibition at the North London Photographic Association last evening, when no doubt they went through a severe fire. With careful management in making the negative, the stern reality of the likeness, is softened down by the Helioaristotypia process, and the result is, we have a portrait with more poetry than anything yet achieved by sun-drawing. In fact, I claim that portraits by this procss are more truthful to nature in the rendering of light and shade.

"I cannot but be highly gratified with your review of our new picture, for it corroborates my own sentiments to a letter; with the single exception of the name of the process 'Helioaristotypia,' which I am inclined to think, although a formidable looking word —on mature thought you will not find it difficult to pronounce.

"I rather like the word, it is at once correct and full of meaning. You admit the pictures are 'aristo'; they are also 'helio'; and certainly 'typia.' Then why not let us have Helioaristotypia all at once? The profession and the public have been photographed to death, and the word photography has become somewhat indefinite in its meaning, before being correct. 'Photo,' you must know means secondary light. Moreover, I deny that pictures made by light are 'graphed.' 'Helio' being sunlight or primary light, therefore must be more correct than 'photo;' and I also lean in preference to the word 'typia,' as being more expressive, besides sweeter to pronounce, than 'graphic.'

"Concerning the cold blueish look of the enamelled glass, you will be pleased to know this has had my serious consideration. I had already taken out a patent for an improvement in flashed or enamelled glass, and expect soon to have the pleasure of submitting specimens of the said patent to you.

"By the way, talking of patents, you had better, if you please, in your next issue, correct a slight error which appears in your last number, 'taken by his patented process.' Helioaristotypia is a secret, and not a patented process.

"Should you think it advisable to publish any part of the above letter you can do so."—*Photo. Notes.*

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Enameling the Surface of Photographs.

A CORRESPONDENT, signing himself "A Northerner," sends us ahotner method of giving an enamel surface to photographs, with some pleasing examples of the effects conferred. The result is very good, and from the nature of the materials employed, it seems probable that the photograph will be entirely preserved from the injurious influence of damp, &c. The process, as described by our correspondent, is as follows :—

Coat the plate with plain collodion, and hold it to the fire, until it is dry, then pour on the collodion a spirit varnish, quickly but gently, as you varnish a negative, pouring back the surplus into the bottle. Lay the plate on a wide-mouthed bottle, and let it stand a few minutes until it begins to dry round the edges. The prints have been previously immersed in methylated spirits; now lay them on the prepared plate, in the same way as that described in Mr. Tunny's process. Press all air-bells carefully out; then take a piece of blotting paper and lay it on a piece of glass the same size as the plate; take the plate and lay it on the blotting paper, card side next the paper, place a weight on the plate to keep the card in close contact with the varnish, and let it stand a few hours. Now remove the weight and take the two plates and keep them in close contact at the ends, with both hands, hold the coated plate to the fire until it is dry. Remove the glass from the back and hold the blotting paper to the fire to see if it is thoroughly dry, as if not it will be a failure. To remove the finished print from the glass, cut the varnish and paper collodion to the glass with a sharp knife, dip the plate in water as hot as the hand can bear it; and on lifting it out the card will come off the glass like the peeling of an onion.

The varnish I have used is one I made two years ago, and I can hardly give the exact proportions of gum used; but it is something like this: 38 grains gum juniper, 10 grains gum shellac (orange), 5 grains black rosin, or fiddler's rosin, as it is called here, into (a small bit of camphor makes the gums dissolve) 1 ounce of spirit of wine (methylated), shake up the bottle before using. Possibly there are better varnishes, but I believe any kind of spirit varnish will answer. A little turpentine would make the varnish I used, more tacky, but I see it objected in your pages, as it darkened through time. If this process be practised, or something like it, we shall hear no more of faded photographs. —*Photo. News.*

Collodion.

BY PROF. J. MILTON SANDERS.

As we sit down to compose this article, the memory of other days becomes awakened. We behold the little room where we first astonished the whole world, "and the rest of mankind," throug hthe marvels perpetrated by aid of our ponderous camera; The world had then just recovered from its astonishment caused by the numerous tokens of M. Daguerre; for that great magician had at length caught the 'silver sunbeam," and had fixed it firmly upon the metal plate. The world was all amazement, for the standing prediction of the chemist,—that the evanescent and shadowy picture of the camera obscura could not be fixed,—had been refuted.

We say that our memory reverted to the little room where we presided over an enormous camera, and where we transferred many wondering and incredulous countenances to the plate, there to remain in iodine, until the action of the atmosphere had faded them away.

In our mind's eye, an individual enters the rooom, his features indicating curiosity, not unmingled with slight expression of fear. He is incredulous—don't believe a word of it, and wouldn't if he was to see it. We reasoned the case with him, explained the solution of the wonderful action of light (as far as it was then known), showed him specimens, and at last he became convinced that even his own features can be transferred to the magical plate.

The formidable preparations for the process commenced, elbow grease is not spared, and often sweating, (and swearing, we were going to say) the plate is finally prepared for the iodine box. A few seconds over that substance rendered it ready for the camera, and in a moment more we stand before the patient. During the busy preparations aforesaid, the individual has been undergoing extensive beautifications. The hair brush and comb have been plied lustily and a coating of infallible hair oil has fastened down the stray hairs and brightened the whiskers. He quickly takes his seat with that will of inflexible determination upon his features indicative of the resolution he had formed to endure heroically all that may be inflicted upon him.

"Just lock into the camera, if you please, for only one minute and a-half, and don't breathe, nor wink, nor turn; are you ready? Now sit perfectly still, and if a fly gets on your nose I'll touch him off."

The patient in the meanwhile has screwed his determination up to the sticking point, he had taken in a deep inspiration preparatory for the long breathless spell, and fixing his gaze into the tube, he commences to stare at it with the firmness, and determination of one who had fully made up his mind to sit the allotted time breathless and winkless, though they would have to cease revolving and make him to swear in the meantime.

For fifteen seconds he sits as immovable as the corpus on a dissecting table, but soon feeling the oppression occasioned by the want of breath, he gives egress to a further part of that confined in his lungs, and his features relax correspondingly. Again another portion of air escapes, and another relaxation of the features ensue, but the resolute individual sits immovable, gazing firmly into the camera. Only two more relaxations of the features, ensued, when time is up. With an ejaculation of joy he springs from the chair, with that feeling of relief one is supposed to experience who has gone through the preliminary preparations for having a token extended. Finally the mercury performs its duty, and the picture is brought out to view Although the several relaxations of the features have blurred considerably, the quick eye of the individual discovers the resemblance of himself in them. He seizes it with rapture, and rushes out of the gallery to exhibit it in triumph to his astonished friends.

If the reader will pardon this lengthy digression, we will at once strive to come to the point. As the caption of this article indicates, we submit a few remarks upon the subject of collodion. We do not believe that the subject is yet exhausted, but that much remains to be learned about it. We have not yet reached perfect tion in it, for there are, doubtless, other "dodges," still to be discovered of incalculable value. We do not profess to have made that discovery—in fact we have made no discovery at all—for the addition of gutta percha to collodion has been used long ago.

In our opinion gutta percha collodion possesses desiderata not obtainable otherwise. It makes the surface of the film smoother, and more like the old albumen film. It gives it more tenacity and makes it adhere to the plate more firmly. It makes the collodion more sensitive and gives an intenser negative, with finer detail. The cadium salts are always the best for this kind of collodion, and the latter should not be too old. To sixteen ounces of plain collodion, and eighty grains oi iodide, and forty grains of bromide of cadmium. In another bottle, *pure* gutta percha should be dissolved in pure chloroform to saturation. About two ounces of the collodion should be poured into a small vial, and a few drops of the gutta percha solution added. But a small quantity of the collodion should be used, as the gutta percha deteriorates it in the course of a day or two, and frequently in a few hours. It sometimes happens that the gutta percha solution will separate from the collodion, or gelatinize it, but if the gutta percha be perfectly pure, and also the chloroform, this may not happen. But even in this case, it is not invariably so, for temperature has something to do with it, and perhaps likewise other causes not yet understood. Some of the finest negatives we have ever taken were obtained with this gutta percha collodion. We have tried caoutchouc, and many other subtances, but with much less success than gutta percha. We find the latter to work much more efficiently in a hot than a cold climate, but in that case the plain collodion must contain at least two parts of alcohol to one of ether. The alcohol must be almost *absolute* otherwise a failure will be the result.

We find that collodion not containing gutta percha must contain at least two parts of alcohol to one part of ether, in order to work efficiently in the Tropics. We spent one winter in the south side of the island of St. Domingo, where the heat is pretty intense, and especially in the summer. For awhile we could obtain no success, but by the adoption of an extra quantity of alcohol in our collodion, we worked without failures. For the benefit of those who have not taken pictures in the Tropics, we would mention, that failures will frequently occur if the bath is of the usual forty or fifty grain strength. It should be diluted down to at least thirty grains, and the strength of the collodion should correspond with this bath.

In conclusion, as we have had considerable success in the use of gutta percha, we would recommend the subject to the consideration of your readers, many of whom possess superior abillties for such experiments.

NEW YORK, Feb. 10, 1865.

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DEXTRINE.—There is no material which makes so good a paste for paper as dextrine. It readily dissolves in water, and does not easily spoil by keeping. It is used on postage and revenue stamps.

On taking Two or More Positions of the Same Person in One Negative.

BY G. R. GILL.

My method of producing one picture containing two portraits of the same person was obtained after many fruitless attempts.

A black velvet screen, just before the sitter, I seen was useless, because the edge would be lit up on one side, and in shade on the other. I therefore sought my end in that wondrous wooden eyeball, the camera. Here I tried the effect of shutters close to the negative, but all in vain, as the division was seen by a hard line. After some further attempts, I found out a part, between the lens and the negative, where the outline seemed so lost as to be invisible. This I found to be just what I had desired. But great nicety in the adjustment was indispensable. For this rough attempt, I formed a framework inside the camera, with an opening a little smaller than a carte picture, which would just admit all the rays of light upon the negative I required; and if my researches had gone no further, this alone would have repaid me, as no end of worse than useless light is stopped ere it arrives at the dark slide holding the negative.

Having now a small opening in the centre of the framework, I proceeded to make shutters of zinc to work in grooves to a centre, the ground glass being divided by a vertical line, over which no part of the separate pictures must be allowed to preject. I focussed with the left shutter closed, and then sat, and my assistant opened the lens; the dark slide was then removed, and the shutters reversed. The remaining half of the negative was thus obtained. In that place of distracted brains—the dark house, with the well-known appliances, I soon found that all was successful. I had a negative of me and myself as painter, sitter, and the easel with my portrait upon it, standing in the middle of the picture, taken by two exposures, and yet no sign of division.

My next satisfactory experiment was to place in the opening of the dark frame a black card, with four elliptical apertures, and a revolving disc with a part cut out, to admit of one elipse being seen at a time. By this method I obtained four portraits of different persons, or different expressions of the same person, shifting, of course, the disc and camera at each sitting; the result was four pretty vignetted pictures upon a black ground, which, by means of a vignetting screen, arranged for the purpose, I converted into a double vignette, upon a white ground, which, were it punched, would, I think, far surpass a diamond cameo.

[Mr. Gill forwarded us, some weeks ago, a very clever picture with the portrait of himself in different positions. He has since shown us many others with very quaint groupings of the same person on the same negative, but no trace whatever of marking or division in the background. It is somewhat curious that this odd application of the art should revive, apparently without concert, in France, America, and this country, almost simultaneously.] —Ed. *Photo. News.*

[The plan commonly used in this city, is to have two slides fitted into the camera shields. Any one of ingenuity can fit the slides for himself, or cn have them neatly made, by sending the shield to Mr. Gordon, or other manufacturers. The shield should be such as is put in at the side of the box; it is difficult to adjust the slides for the shield which goes in at the top. The line of junction is commonly made along the fluting of a pillar, in which case there is little of the difficulty which Mr. Gill experiences. A great variety of positions and other modifications of the effect will readily suggest themselves to the thoughtful.]—Ed. Am. Journ.

The American Photographical Society.

ANNUAL MEETING.

The Society held a regular meeting on the 13th ult., at the University; President Draper in the chair; Oscar G. Mason, Secretary.

This being the Annual Meeting, the proceedings pertained chiefly to the business affairs of the Society.

The election of officers for the ensuing year resulted in the choice of the following :—

President—JOHN W. DRAPER.

Vice-Presidents—LEWIS M. RUTHERFORD, CHARLES A. JOY, ABRAM BOGARDUS.

Corresponding Secretary—C. WAGER HULL.

Recording Secretary—OSCAR G. MASON.

Treasurer—HENRY J. NEWTON.

In order to give greater interest to the first occupation of the new room, it was agreed, the President having given his consent, to postpone the Annual Address to the the next meeting,

The society adjourned to meet on the second Monday in March, in the building on the N.W. corner of 20th St. and Broadway.

Photographing upon Painters' Canvas.

The superiority of canvas as a basis for oil painting, is well-known to artists, and hence it has been considered important to devise some means of printing the photographic image on the prepared canvas which the painter prefers for this class of work. The various methods proposed have not been very successful, and have involved much trouble in preparing the surface of the canvas, so that it shall not repel aqueous solutions; considerable rubbing with alcohol or alkaline solutions being necessary, In the course of some recent experiments, we have discovered a very simple method of effecting the desired end, and securing a very good result. It consists simply in coating the surface with our preparation of collodio-chloride of silver, exposing under a negative in the usual way, and then toning and fixing as would be done with a paper picture.

We have used the fine canvas used for delicate work, silk being the tissue, we believe, on which the ground is laid, and have found no difficulty of any kind in getting good results. Of course, after the printing is completed, the canvas can be stretched upon a frame for use in the ordinary way.

It is, perhaps, necessary to observe that some care should be used in selecting a suitable collodion. If it be of the tough and horny kind, it will be liable to leave the canvas, and spoil the work, when it is, perhaps, completed. But if it be of the kind distinguished as giving a powdery film, it will adhere with perfect tenacity, and can only be removed by the use of a solvent.—*Photo. News.*

Editorial Department.

——Several of our city galleries have recently introduced, as a novelty, photographs showing two positions of the same person on one card, and printed from one negative. Veteran daguerreotypists will remember that a similar style was somewhat in vogue about fifteen years since, and they will readily understand that the methods then used for producing the effect are applicable to modern photography. To the tyros, it is perhaps sufficient to say that the ways of producing the double pictures are the same as those used for making the caricatures, where the head of one person was set upon the shoulders and body of another person ; except that in the first case, the right and left halves of the plate are used, while in the latter the upper and lower parts are successively exposed. For further particulars, see the article and the comments appended on page 405.

The double pictures made in this city we do not consider artistic. The style is best suited to caricatures and comic illustrations. The most pleasing and useful of double pictures to our mind are those where a mirror is used to produce one of them. In this case two views of the same person are made on one plate at precisely the same point of time ; and the plan is capable of a great variety of modifications.

—— Those interested will please keep in mind the place and time of the next meeting of the Photographical Society.

Minor Correspondence.

The following notice from Mr Lea, of Philadelphia, receives our cordial approval. We trust it will lead to a representation of American photography in Germany. "Under the auspices of Dr. Vogel, who as a scientific photographer, stands among the very first of the day, the Photographic Society of Berlin has planned a great photographic exhibition to take place in May next. Dr. Vogel writes that he is very anxious to have American photographs fairly represented, and that especially all those things which are characteristic of the country and the times will be particularly welcome. These are, portraits of notables, Lincoln, Grant, Sherman, and other distinguished men, battle-scenes, views, buildings, scenes in California, &c. Those who may desire to contribute should send their specimens with the least possible delay, to Mr. Charles Cooper, 142 Chatham Street, New York."

H. R., of O.—" Would it be of sufficient interest to your readers to justify you in giving, in your next Journal, a quick process for making childrens pictures?" ....The interest of readers would certainly justify us in giving such a process, if we had one, or knew of one. We confess our ignorance. We are as anxious as H. R. to have the process. We believe it is yet to be found out.

M. N., of Me.—"I am about to fit up a room, and I want some information about the skylight. My operating room can be finished 24 × 18, pitch of roof 45°, and south light. Now what I wish to know is, what kind of glass is best, ground or blue? or if it is necessary to use both, and if I want a side light in connection with it?" . . We should prefer the blue glass ; but the blue glass should be made movable, and also be provided with movable screens of muslin, or ground glass

J. S. M., of N. H.—" Will you send me the receipt for putting the polish on cards. I send you a piece which I have peeled from one. I would like to know how to do it, if I can." ....For the process you want, see articles in this and other recent numbers, on enamelled photographs. The sample you send is collodion on one side and gelatine on the other, probably made after the process on page 359.

THE AMERICAN

Journal of Photography.

[NEW SERIES.]

VOL VII. MARCH 15, 1865. NO 18

On Intensifying Negatives.

BY W. H. SHERMAN.

Having just read the article by Mr. Lea on the production of Scarlet Negatives, I will lay before your readers another method of intensifying negatives, by which almost any degree of intensity may be produced. I find it particularly useful in copying engravings and other pictures. As it is in the hands of the "process pedlers" as a new and brilliant discovery, selling readily for the inevitable "five dollars," I am out after the *honor* of the discovery as my share of the spoils, although I should not be surprised if it were to appear that it had been used by others years ago.

Although it is a very small affair, it is nevertheless a great convenience. This is also true of a thousand other simple facts. What a trifling thing is the friction match ? But there are in its little blue tip two or three centuries of thought !

Now this digression is an attempt at an apology for what follows, and I would say further, that as a reader of your Journal, I would be glad to see more bits of experience, scraps of knowledge, hints, suggestions, and startling announcements from our fellow workers in the art photographic. While to those who, like Mr. Lea, introduce new substances into our laboratories we will acknowledge still greater obligations.

In my practice I always have at hand a bottle of the sulphide of potassium, to use as occasion requires. For I frequently find that negatives, which after development appear sufficiently intense, do not after fixing present in the high lights quite the requisite degree of opacity for printing purposes. If now a weak solution of sulphide (1 oz. to a pint of water) be poured over the plate, the color of the lights will be changed from gray to black. If carefully performed the change will be in the *color only*, without any perceptible thickening in the middle shades, giving the negative better printing qualities.

But it often happens in copying and enlarging daguerreotypes and ambrotypes, and in copying engravings, that a much greater degree of intensity is required than can be produced under the developer. This I have found to be easily effected by the use of the *iron developer* in conjunction with the sulphide of potassium.

After fixing and washing, pour some of the developer over the plate and let it remain one or two minutes; then wash the plate *evenly* but not quite *thoroughly*, after which apply the sulphide. Pour back into the bottle and examine by holding to the light and repeat *ad libitum.* If this will not answer, wash off the sulphide, as directed for the iron, and apply the developer the second time and repeat with the sulphide until the lights are as opaque and black as desired. The more of the developer there is on the plate when applying the sulphide the more violent will be the action, and in consequence, the greater liability to streak. On the other hand, it will be found that by first applying the developer after fixing, and then washing it off thoroughly, the liability to streak will be removed a beautiful uniformity of action will be the result. As a rule, I should say that a *fully exposed* negative which is lacking in vigor, may be strengthened in this way better than in any other, and that an under-exposed negative or one with just the rtght exposure may be strengthened best with the pyrogallic re-developer.

MILWAUKIE, WIS., Feb. 25th, 1865.

A Visit to Boston.

WE have been to Boston—the first time in our life—to the veritable Hub of the Universe. It is an axiom in natural philosophy that the nearer the axis of the revolving body the slower the motion, until at the absolute centre there is no motion at all. And this reminds us of an incident in our school days. A bright-faced boy in our philosophy class refused assent to the above proposition, dared even to disbelieve the teacher, the expounder of dogmatic science, and raised the query, " Does the centre of a grindstone twist round and refuse to turn while the outside revolves ?"

Our approach to the world's axletree convinced us that there was at least one exception to the great philosophical proposition. We found the motion at the hub as rapid as it is farther toward the periphery—New York, or even Chicago. Yes, Boston is a fast place, progressive in the true sense of the term, the focus of the nation's intellectuality.

Everybody has heard that the streets of Boston are crooked, but they are much more so than we had ever imagined from description. To use an illustration not original, the town looks as though the buildings had been shot from a gun and allowed to remain just as they struck. However the buildings generally exhibit good architecture, many of them being fine.

Our trip to Boston was mainly for a photographic purpose, and we cannot treat further of matters that do not appertain to photography.

"They make fine photographs in Boston," is an expression familiar as household words to us. We have been there and seen them. They do. In Boston there are men engaged in photography who take pride in their profession, who labor incessantly to improve. In Boston there are photographers who are gentlemen —men, intellectually and morally, some of them physically also. We made acquaintances in Boston of which we are proud, Mr. Marshall, Mr. Whipple, Mr. Black, and others.

Mr. Marshall showed us some copies of works of art which were splendid. Mr. Whipple took our picture, the best we have ever had, although under the disadvantageous circumstances of fatigue and indisposition on our part. Mr. Whipple knows how to get a good picture out of any kind of a face. His geniality oozes out so profusely that the subject finds himself within the sphere of his magnetic influence before he is aware; and no matter how morose and sour his disposition, his face must become bland and mild, if not actually radiant with smiles.

Mr. Black very kindly conducted us through his immense photographic establishment. A person imagines after going through the various departments of Mr. Black's gallery that he has been in every loft, chamber, garret, nook and corner in a whole block of buildings. Well he has nearly. Mr. Black's business is colossal. He deserves it; he has fairly earned it by industry, integrity, and good pictures. Mr. Black has on hand nearly *one hundred and fifty thousand negatives.*

We were sorry to leave Boston, with its honored photographers, its splendid Common and *Dock Square.* We are going again one of these days. S. R. D.

New York, March 6, 1865.

Photographic Maps.

A map of the town of Greenoble and its environs embracing twenty square kilomètres, has been produced with the aid of the camera in a very short space of time. The immediate object in view is the obtaining correct topographical profiles for military purposes, and, consequently, the means of placing an attacking force completely out of the reach of danger, but maps showing the undulations of the land are of too evident utility to require any special application to illustrate their value.

The map in question is made to a scale of one in five thousand, and was entirely produced in Paris from twenty-nine photographic views taken from eighteen different points, by Captain Javary. The selected points were partly on one side of the river Isère, and on the other, and it is believed that not a single accident of the outline has been missed. The extreme elevation of the ground on the right bank of the river is more than three thousand feet. The shortest distance at which a view was taken was about a thousand yards, the greater part were at fifteen hundred yards, and some few as distant as four thousand five hundred. It is stated on the authority of M. Laussedat, with whom the plan originated, that the fitting of the levels is such as could not have been produced by any other known method of expeditious military reconnaisance.

The views were taken by two lenses of different focal lengths, namely, one of fifty centimètres, the other at twenty-seven. The former was employed for tolerably large representations and objects at a distance, or where it was found necessary to take special notice of details, and the other, which took in a field of 60°, for the shorter distances. The photographic operations only occupied about sixty hours, and the subsequent preparation of the map two months.—*Art Journ.*

Concerning Backgrounds.

BY JOHN F. CUSSANS.

In turning over the leaves of a photographic album, our sense of propriety and good taste is not happily so much outraged as formerly by the startling backgrounds, and hetereogenous collection of properties gathered around the sitter as accessories; yet still there is great room for improvement in this respect. Only last week a gentleman showed me a portrait of himself, which represented him in the costume of a sportsman stepping over a stile. A garden scene did duty for a background, in the centre of which was a fountain of two jets, which were so artfully contrived that they furnished him a magnificent pair of horns, in the manner represented by Hogarth in his picture of the henpecked husband with his family at Sadlers's Wells. The only field of cloth, of which I remember to have heard, was that in which Henry VIII. and Francis met and enjoyed themselves; but in the photograph which was submitted for my inspection, I discovered that the stile separated two fields of oil-cloth. These absurdities did not seem to present themselves as such to the gentleman; for he expressed himself highly satisfied with the production, and called my especial attention to one foot which was raised, exhibiting all the nails in his boots, which he seemed to consider a marvel of photographic art. He was a member of a skating club, he informed me, and wished to be taken with a winter scene, and something white on the ground to represent ice. Can anything be imagined more graceful and natural than a skater doing the "outside edge" *with a head-rest?*

Now whose fault is it, that such abominations, conceived and executed with such a reckless disregard to the eternal fitness of things, are produced? Are the public, or their pictorial biographers, to blame? Photographers—or at least those who are guilty of the atrocities to which I allude—will answer, "The public demand and pay for them, and it is no business of ours whether they are in good or bad taste." Pardon me, it *is* your business. It would be idle to suppose that a photographer could—but by the veriest accident—produce in two miuutes as artistic a picture as Sir Joshua or Sir Thomas would possibly have consumed weeks in arranging; but he can at least avoid such glaring inconsistencies as I have pointed out. It is an old proverb, that "if there were no receivers, there would be no thieves;" the converse of this proposition is equally true; so if there were no photographers willing to gratify the depraved taste of certain sitters, it is very evident that the astounding absurdities which we occasionally light upon could never be perprtrated.

Simple figured or diapered backgrounds are also to be deprecated—though, perhaps, in a milder degree. There is certainly one advantage which they possess in common with scenic backgrounds, over plain ones, and that is, that they frequently conceal a multitude of streaks and stains in the negative. Beyond this I can think of none other: but I could enumerate a dozen *dis*advantages arising therefrom. The principal is, that should the sitter's face be turned at all in profile, and ever so small a piece of the pattern behind show on the nose, for instance, the whole character of the face is changed, and the sitter's friends without, perhaps, being able to discover what is the fault, unanimously concur in the verdict, that it is not a likeness.

If, however, the photographer be resolved to have a figured or diapered background, the least objectionable is flock paper painted in flatted oil the requisite tint. It will be found much easier to paint it at once in flatted oil, than to flat it afterwards, as streaks or "cut shades" are very apt to be caused on account of the rapid evaporation of the turps. For plain backgrounds, I am convinced there is nothing as good as distemper, and I believe I have tried nearly everything. In the first place, it is a very difficult matter to get an oil background perfectly smooth and dead, not to mention the expense; for there are few photographers who are sufficiently adept in the art of painting to do it themselves.

Should it become soiled, it can be washed, certainly, which, of course, distemper cannot; but ten to one before it requires it, it will be so scratched and marked as to require repainting. Some time ago, I bought a piece of extra wide cloth, made expressly for backgrounds; but, after it was stretched, the seams caused by folding were painfully apparent, and no amount of sponging and ironing would remove them. It is now degraded to the position of a table cover in the dressing-room. Then I tried a sort of French felt, which the traveler who exhibited the sample declared was *magnifique*. This to be wrapped on a long roller, so that there should be no folds; but here again I was doomed to disappointment; for I found on opening it, that it was completely traversed with well-defined and indelible ridges caused by the roller. If, for no other reason, distemper should reign paramount on account of its economy and cheapness. There is a vast amount of difference in the meaning of these two words.

For the sake of those who are anxious to distemper their own backgrounds for sixpence, as I stated in a former paper, every photographer ought to be able to do, I will briefly detail the *modus operandi*. If the canvas be quite new, and have never been painted on, it will be necessary to give it one or two coats of size or thin glue; it is better, however, to prime it with a coat of paint. Then prepare the color. The easiest to use is umber alone. This gives a full, dark photographic tint, which can be lightened to any degree by the admixture of whiting. Mix one pound of umber, which costs twopence, with about half a pint of water; stir it well, then add about three-quarters of a pound of hot size (three farthings) and another half pint of water. A piece of whiting in addition to this, about the size of an egg, will render this a very good tone for a general winter use; backgrounds, in summer, can always be a trifle darker. Strain through three or four thicknesses of canvas, so as to filter out the scum of the size and lumps of color. This quantity will be sufficient for a background eight feet square, supposing it to have been previously with distemper. On no account must it be used until quite cold, when it ought to be of the consistence of thin jelly. It is better to use too much than too little size, for if the color be too thick when cold, it can be diluted with water. A two-or-three-tie brush is best to apply it. Vegetable or drop black and whiting, with a suspicion of venetian red, give a very agreeable tone, but is difficult to manage, as the black is so light that it does not readily amalgamate with the other colors. As it is almost impossible to mix it with water, it must be put into a basin with a little hot size, and beat into a paste; then add the water and other colors. Some painters use milk or porter in the place of water, but I have not been able to discovery any difference in the results. A flatted background must never be covered with distemper, for it will most certainly cause it to crack, leaving irregularly-shaped concave patches varying from one to six or eight inches; and subsequent coats will rather increase than lessen the evil. Should the photographer wish to distemper a flatted surface, he must previously paint it with ordinary oil color, which is elastic and admits of the contraction caused by the distemper. A new background is much improved by rubbing it with pumice-stone, after the first coat of color is dry, so as to wear down the knots and other roughnesses in the canvas. If the same color be always employed, five or six coats may be laid on successively; but it is difficult to apply a light color over a darker, as the latter is apt to "ruck up." In such a case, it is safer to wash off the old color with warm water; or, as this is a dirty job, cover it with oil color. The inexperienced painter should not attempt to use distemper when there is much moisture in the atmosphere, for, unless the painted surface dries quickly, the color is likely to run down in irregular streaks; this annoyance, however, will not occur if the color be properly mixed up and skillfully applied. It is always well to prepare double the quantity of color required, in case the first coat should not dry perfectly solid.

One important fact must be borne in mind; and that is, that distemper always lightens considerably when dry. Supposing the range of colors from white to black to be represented by twelve, the difference between the same color wet and dry would be about two. In cases of urgent necessity a distempered background can be speedily dried by passing a hot fire shovel before it, in the manner recommended by M. Soyer for braizing omelettes. Care, however, should be taken not to hold it too long over one spot, or it will cause the water and color to separate; the former running down in tears; besides making the under-coating of oil-color blister.—*Photo. News.*

Something Practical about Distilled Water.

> "One with a flash begins and ends in smoke;
> The other out of smoke brings glorious light."—
> *Hor. Ars. Poet*

It is one of the most telling arguments against the utility of the infinitesimal doses of a certain school of medicine, that we are taking daily, without our will and perhaps unwittingly, mingled with our food those very agents which are said to act medicinally when otherwise administered, and in certainly not larger doses We eat in our bread the homœopathists' *calc. carb.* and *phos.*, with our eggs *sulph.*, and drink his *caffeine* every day from his breakfast cups. Now, some photographers of my acquaintance are equally inconsistent and unreasonahle. They are most precise in the weight and quality and admixture of their nitrate of silver; scrupulous careful that bottle and bath have no trace of dirt about them; and yet these very gentlemen purchase their distilled water at the nearest chemist's, and buy with it theelements of failure in a host of impurities.

It is notorious how little care is paid in druggists' shops to this cheap article—perbaps because it answers the usual purposes of the boluses and decoctions with which it is incorporated—none the worse for having a snatch of every saleable commodity about it. If originally it was purchased, and obtained from the condenser of the nearest steam-engine, it becomes, after a sojourn of a month in an open carboy, underneath the counter, totally unfit for photographic uses. Three samples bought lately, which I have tested by adding small crystals of silver, have become more or less perceptibly milky, and when this is the case there is usually sufficient obnoxious matter present in any bath made with it toquite unfit it for the production of good pictures.

It has been stated that ordinary river or spring water will serve for the nitrate of silver solution for negatives. This is "a delusion and a snare." It has been tried and failed; indeed no rain water that I have ever caught, even in an open pan direct from the sky, has been pure enough to stand the simple test of a few grains of silver and exposure to light, without becoming sensibly diminished in brightness or turning brown. It is true you may by repeated doctorings, such as neutralising, acidifying, oxydising, sunning, and by other orthodox formularies, succeed in soothing the fog-producing *Naiad* for a little, but she only waits the cessation of your vigilance to trouble you again with streaks, spots, comets, bi- and trifurcate transparencies, and other diabolical markings.

Sir Joshua, when asked what he mixed his color with, said, curtly, "Brains, sir! brains!" If I were asked the secret of successful manipulation in photography, I might say, "Water, sir! pure water!" for I believe that nothing spoils so many pictures and experiments and tempers, nor causes so much blame to be hurled upon the innocent chemical makers, nor renders dark-room work so tedious and hard, as unsuspected impurities in this ubiquitous solvent.

If such, then, be the fact, it behoves every photographer who would work with comfort to have a still under his own inspection; nay more, I would recommend him to use it himself, at least for that portion of the product to be used for the dark-room requirements, for he will find many cases and precautions necessary. It wlll be waste of money to buy any of the tinnsd iron stills advertised; they are worse than useless; they are regular failure-traps. In addition to the rust that is formed where the iron is exposed by a transverse cut, and the incessant need of repair, the water, either as steam, or in process of condensation, acts upon and dissolves the soft metal of which the worm is made. This is carried down in the distillate, and a dense whitish scintillating deposit is found at the bottom of the receptacle after it has been allowed to rest. Copper for boiler, head, worm, and fittings, should be the only metal used, and this should be brazed, and not soldered in the usual way, as a thick white crust (perhaps one of the oxides of lead) is apt to be seen in the latter case.

The still I use was made by a brazier in the town, from my instructions, the following being as nearly as I remember the cost :—

Still, complete..........	£2	8	0			
Bricks, mortar, and labor.....	0	10	0			
Iron flue pipe.....	0	6	0			
Grate and fire-place.........	0	5	0			
				£3	9	0

The boiler is made like a large saucepan, and holds about five gallons. There is a water-guage three inches from the bottom and a short pipe having a tap in it, and a funnel at the top to put the water in whilst is operation. A copper ball serves as a head, a pipe springing from it, coiling four or five times in the condenser, which is simply an old butter-barrel re-hooped. The flue runs round the boiler, and the smoke reaches the air by a six-feet length of four-inch pipe fixed into the brickwork.

Using, as I do, distilled water for washing the prints previous to toning—a nicety not without its reward—I calculate that the whole apparatus paid for itself within a year, over and above the incalculable benefit of keeping one guiltless of undeserved anathemas against the silver dealers—"a consummation devoutly to be wished."

The course, however, of the distillate from new stills does not always run smooth. There are some things yet to be borne in mind. See that the liquid you put into the boiler be tolerably clear and free from organic matter. During the recent severe storms we have had in Cornwall, the water supplied by the company's mains to the town where I write was brown with earthy and other matter in suspension. It was found impossible to get a pure distillate. Small, floating, half-transparent "somethings" could be seen in countless and undesired abundance. Of course there was no remedy; but recourse being had to a neighboring spring for a better sample of the raw material; the result was as pure as usual. It is hoped these hints may induce those of my brethren who are disposed to adopt the theory of the early photographers—"that the behavior of the bath was a most mysterious and occult" matter—to hesitate before endorsing that opinion, and first try the distillatiod of their own water. R. H. P.

—*Brit. Journ.*

Enameled Photographs.

[We are anxious to give our readers everything which appears on this interesting subject. The two processes below have but littlenovelty, yet may be suggestive. We quote them from an English journal.]—Ed.

FIRST METHOD.

To Prepare the Glass Plate.—Take a sheet of glass any size, and, after cleaning it (which I do with an old collodion), I pour on its surface a few drops of a solution of white wax in sulphuric ether; then with a tuft of cotton wool rub well all over the plate and polish with a clean towel. Now coat it with uniodised collodion. It should possess a good body and be rather tough.

To Prepare the Gelatine Solution.—To one ounce of gelatine add twelve ounces of water, and some white of egg to clarify. Now take the print (after it has been touched up), lay it face downwards, and damp the back with a tuft of cotton wool, previously soaked with a little water, so as to make it lie flat. Have ready a porcelain tray a little larger than the print (5 by 4 will do for carte de visite size); pour into it a small quantity of the hot solution, just sufficient to cover the bottom, and float the print on it for a second. Lift it out and examine it. Should any signs of greasiness appear, take a small camel's-hair pencil, dip it in the solution, and gently rub the part until it disappear. When such is the case the print must be refloated. When perfectly covered drain for a second or so, and then place it face upwards on a flat surface to dry. A second coatfng may be given with advantage, and again allowed to dry. Any number of prints may be prepared in this way, When dry, dip it in cold water, and lay it on the collodionised plate. This is best done by letting one edge come in contact with the glass, and then laying it down so that the water may flow before the print. Now place over it two thicknesses of blotting-paper, and run a paper knife over the whole, using gentle pressure, when all air bubbles will be removed. It should next be placed on the mantel-piece, or other convenient spot, in a warm room, to dry; and in an hour or two it will be ready to be stripped from the glass. For large prints this process will be found very advantageous.

To keep the gelatine warm, place it in a second tray containing hot water.

The process just described possesses some advantages over others; for instance, all spots on prints can be touched out previous to floating on the gelatine, which cannot be done by some other published methods. JOHN FREW.

ANOTHER METHOD.

Take a sheet of polished patent plate, coat carefully with plain collodion, and dry before a clear fire. Next lay the print, face downwards, upon a flat board, and brush the picture well over with thin starch paste; then place the picture in contact with the collodionised plate, press out the air bubbles, and leave it under slight pressure till dry. But if it is desired to dry it quickly, lay a pad of white blotting paper upon the back of the picture, and place a warm flat iron upon the paper; it will then dry in ten minutes or so. When dry, immerse in cold water for two minutes, the picture may then be detached from the glass easily.

Arrowroot, gelatine, or glue will answer the same purpose as starch paste. They may either be poured upon the collodionised glass or brushed over it, the same as when treating a print for moutning.

G. H. Richards.

On Reflections from the Second Surface of the Negative.

BY M. CAREY LEA.

I have felt some interest in following the extended discussions which have taken place on this subject, and have remarked that although the specimens of negatives said to have been exhibited by Major Russell appear to have pretty clearly proved the correctness of his views, still many people have declined to be convinced What appears to be wanting is an absolute and unanswerable demonstration, such as every one must accept under the penalty of self stultification. And this I think I can perhaps furnish.

It frequently happens that in studying subjects quite disconnected, they will throw very unexpected light on each other, and this has happened in the present case. I have been making experiments in light quite disconnected with photography in which I had occasion to employ plates of colored glass. While using them, it occurred to me that they could afford me an excellent means of studying the whole subject of reflection by a second surface,—of observing as to whether the remedies proposed were effectual or not. My results were as follows :—

If we hold a piece of blue glass in a horizontal position in the sunlight, so that its reflection will be thrown upon a white ceiling, we shall see a bright white spot, consisting of light reflected from the first surface. To one side of this white spot will be a bright blue mark consisting of light reflected from the second surface, and which,having twice passed through the blue glass has, taken its color.

Here we have the two portions of light, side by side, and perfectly distinguished from each other. That reflected from the first surface is, of course, ordinary white light; that which has passed through the glass, has in doing so, received a stamp which distinguishes it unmistakeably from the other, by its difference in tint.

Evidently, we have here, not only the desired demonstration, but also an admirable means of testing the efficacy of the cure. We now remove the glass and apply to it a piece of wet red blotting paper on the under side, and replace it in the sunshine. The white reflection is the same as ever, but the blue is absolutely gone! No description of this experiment can convey the perfect mental conviction which is produced by witnessing it. For my own part, whilst I have always believed in the truth of Russell's explanation, and in the advantage of the red paper, I was not prepared to find the cure so complete. I believed that if the paper were attached by a substance whose index of refraction was very nearly equal to that of glass, as for example, Canada balsam that the remedy would be perfect. But the index of water differs materially from that of glass, and one would therefore, *à priori*, expect that the cure, though valuable, would not be perfect. After attentively observing the experiment which I have just detailed, I have somewhat altered my opinion, and in future intend to use the remedy invariably.

So far my results agree so nearly with opinions which have obtained acceptance, that I presume they will be easily received. With what I am next about to advance, the case may be different.

As soon as I had convinced myself of the foregoing experiment, that the difference which exists between the indices of refraction of water and glass, did not interfere with the efficacy of the remedy, it occurred to me at once that the red color of the paper had nothing to do with the cure but that this depended solely on the power of the water to *lead the rays out of the glass ;* an experiment proved the truth of this—white paper was just as effectual as red! The cure was complete with either.

This whole subject is one of such unsurpassed importance to photographers that these experiments will doubtless be repeated by many who like to convince themselves by ocular inspection. I hope they will be. In order that they may be, I now propose to enter into a few of the details, desiring to clearly point out, that whilst this experiment is, when properly performed, a most beautiful and convincing one, yet careless manipulation will lead to contradictory and worthless results

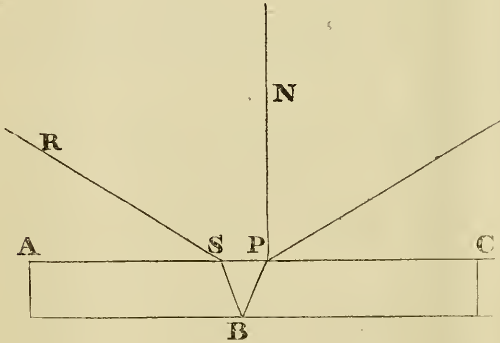
1. The only kind of glass that is really fit for the experiment is the violet blue sort, which is colored by cobalt. Glass colored purple with manganese is apt to be so opaque that the ray internally reflected is almost absorbed. With yellow, green, and red glass, the colored light is visible, but is very inferior in distinctness and brilliancy. With the cobalt glass, the colored light is very distinct and beautiful.

2. The blue light appears chiefly as an edge or border to the white, but not altogether so. Sometimes it will be one side, and sometimes on the other—sometimes, above, sometimes below the white. This does not depend, or only indirectly, upon the greater refrangibility of the blue light, it arises from the fact that the two sides of the common blown glass are not strictly parallel, so that any piece of such glass may be looked upon as an irregular prism, very thin, and with a small angle of divergence. This is a decided advantage, it tends to throw the blue rays aside from the white, and render them more distinguishable. If we used plate glass, the whole of the internally reflected light would coincide in position with that reflected from the surface, thus simply imparting a bluish tint to it, which, in view of the far greater intensity of the white light, would probably be imperceptible.

3. The glass used should not be less than four to six inches square, and it is best to obtain several pieces for trial. Because as explained above, irregularity in the glass favors the observability of the phenomena, by collecting the blue light in masses and spots. Therefore, if different pieces of glass be tried in succession it will be found that some answer greatly better than others. In some pieces a slight sphericity of surface in spots will cause spots of

blue to appear in the midst of the white as well as at its edges. This is ascribable to slight convexity in the back surface of the glass. On the inside, this convexity takes the form of concavity and collects the internally reflected light into a spot.

4. We all know that light incident on any transparent surface is divided into two beams, one reflected, the other refracted The relative proportion between these two varies according to the angle of incidence, the amount of reflected light increasing as the angle of incidence increases.* I was therefore prepared to find the blue light more abundant when the angle of incidence was large, than when the light fell perpendicularly upon the plate. But in experiment, the difference was inconsiderable. This may I think, be explained in the following manner :



The differences of the indices of refraction of air and water are so very great that a ray of light, L, even if tolerably oblique, striking the first surface at P, is greatly deflected towards the normal, N, following the path P B. From B it is reflected making the angle of reflection equal to the angle of incidence. On issuing again into the air at the first surface, S, it is again refracted, and although it makes the angle R S A equally oblique with the angle L P C* But the lines of incidence and reflection at the second surface B, are much more perpendicular than those at the first. The angles of incidence and reflection at the back surface therefore, vary much less than those at the first, with the obliquity of the incident ray, and therefore there is much less difference in the amount of blue light reflected than in the amount of white, and this accords closely with the results observed.

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* As many of my readers may be unacquainted with optics, I may mention that the angle of incidence is always measured with the *normal*, a line perpendicular to the plane of reflection. When therefore the ray of light is nearly parallel to the plane of reflection, its angle of fncidence is said to be large, and conversely. I mention this because it is the reverse of what would be expressed in familiar language.

5. The most satisfactory way to perform this experiment, is as follows. Allow a small beam of sunlight to enter a room otherwise tolerably dark. At the window place a table, on the table a piece of board in a vertical position by the edge of which the sunlight passes. On the board attach a sheet of white paper. Placing one's self two or three feet from the board, hold the glass in the beam of sunlight, and throw its reflection on the white paper. This will give a nearly perpendicular incidence, corresponding with that which occurs in the camera. If the glass be suitable, an irregular beautiful blue border will be seen, or irregular blue lines or spots. (The blue is more apt to appear as a border when the reflection is thrown upon the ceiling or a distant wall, the distance bring out the small angle of divergence between the white and the colored rays.)

6. Having thrown the reflection on the white paper, we observe what position of the glass, and which of its two surface gives the most striking result. We next apply a piece of red blotting paper well wetted, and we observe the instant disappearance of the blue color. We carefully repeat the experiment with other colors, and find the result the same. Finally with white, which we find equally efficacious in destroying the internal reflection.

7. These experiments teach us exactly how we must apply our remedy in actual practice. It is the water that leads out the light, not the paper. Nevertheless a film of water on the back, will not destroy the blue reflection. Naturally not, because *the posterior surface of the water itself* then produces a new and effective reflecting surface. *To destroy the back surface of the water* is the real function of the paper. In actual practice, I should be disposed to prefer dark colored paper to white, which must throw back some light, although rendered partly transparent by the water.

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* In the case of violet glass, the angle R S A would not be equal to L P C. This aids in throwing the violet image to the side of the white as explained above. But this consideration is unimportant in the matter now under discussion.

Still, there is no observable difference in the effect of the white and red paper.

I am disposed to ascribe this, certainly at least in part, to the extreme irregularity of the surface of paper, whereby the reflection is broken up and scattered. The back surface of the glass consists of surfaces of comparative regularity, which, especially when slightly curved, as they are apt to be, tend to collect the colored light in spots or streaks, and thus to render it evident. The granular surface of the paper tends more to distribute the light which it reflects, and thus conceal it. Whilst I think therefore, that white paper will be almost as effectual as red, still whatever choice there is must always be in favor of the non-actinic color.

8. If we now allow the paper, white or red, to become partly dry, and repeat the experiment, with the paper in state only damp and not actually wet, we see the blue ray at once re-appear. We learn at once from this the importance of keeping the paper which we apply behind our negatives *thoroughly wet,* and not trusting to such a degree of dampness as will cause the paper to adhere.

And again, apply the paper carelessly leaving a few bubbles of air between it and the glass, place it in the sun, observe the reflection :—distinct evidences of spots of blue light are perceptible.

The simple experiment which I have here detailed adapts itself to a great variety of cases, and will prove I think a very valuable means of inquiring into all the cases of internal reflection which may present themselves. The irregularities in the curvature of blown glass, for example, produce spots of blue light in the midst of the white.* Now many negatives are taken upon window glass (in this country, almost all,) and these spotty reflections must tend to produce irregularity in the developed image.

Whilst the blue color of the glass in this experiment by stamping itself upon the internally reflected light, enables us to distinguish and appreciate it, we must not forget that it diminishes its apparent quantity. Let such a piece of glass be held in the sunlight in front of a piece of white paper, and let the difference in the intensity of the illumination be marked, and the observer will perceive how considerable a proportion of the rays are stopped *in transitu.* Now if we consider that the light reflected from the back surface in our experiment has passed through the glass twice, we shall understand that it must have been greatly lowered in intensity. With the white glass, or nearly white glass used for negatives, this is not the case. We conclude from this that the proportions of prejudicial light reflected in practice, with white glass, is greater than is indicated by this experiment in which blue is used. And we are thereby all the more strongly impressed with the advantage of Mr. Marlow's water-cure.

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* These spots are very plain and well marked when the reflection is thrown upon a clean white surface distant only two or three feet from the glass, but not when it is projected against the ceiling or a distant wall.

Finally, I would wish that every photographer who feels really anxious to accomplish as perfect work as possible, should carefully repeat this experiment. When he sees the well-marked blue borders and patches which clearly prove the presence in all ordinary photographic work, of extraneous and noxious light, here only rendered visible by dyeing them with the color of the glass through which they have passed, he will think it well worth while to avail himself of the simple and effectual means of suppressing them, before effectiveness he can make immediately incident to his own perceptions. He will also learn the necessity of applying the remedy in the right way, viz., that the paper shall be thick and soft so as to hold water easily and abundantly;—and that it shall be thoroughly wetted, and evenly and smoothly applied. I do not doubt that Mr. Marlow's remedy will come into general use. Mr. Coleman Sellers after careful experiment, pronounces it a decided advantage in copying drawings and engravings. In fact its applicability to every branch of photography is perfectly manifest.

PHILADELPHIA, Pa., Feb. 2d, 1865.

Lime in the Toning Bath.

BY T. S. REEVES.

I HAD long suspected that the lime, in the lime toning bath, was the only useful ingredient, and that was to neutralise the free acid; the chlorine being harmless in proper quantity, and injurious in excess; but I was too idle, or otherwise employed, to go to the trouble of testing its accuracy, especially as my toning never gave any trouble, and worked best on the day mixed.

Seeing Mr. Heisch's views on the subject, that the chloride of calcium was the active ingredient, I became more convinced than before that my views were correct; and I made the following experiments :—

A bath was made exactly as described by Mr. Heisch, with calcium; and one containing one grain of chloride of gold to a few drachms of water, neutralized with lime water, until a strip of litmus paper, in the solution, turned from red to blue; more water was then added, to make it up to eight ounces.

I tried the two baths soon after being made, and found they both worked very quick, and gave excellent results; in fact, I could see no difference between the two; and the next day they worked as well as the first, and as fast. An excess of lime water seems to do no harm.

I found, however, which I did not expect, that they must be taken out as soon as the desired color is obtained, or, otherwise they change as in a chloride of lime bath; and both of my baths did the same, that is, the chloride of calcium bath, as well as the lime-water one.

I therefore come to the conclusion, that a gold bath neutralized with lime water is all that is required, and that the chloride of calcium is useless. I send a print from each bath of a weak negative, removed too soon for the black color, which is easily obtained.

[Both the prints are very brlliant in tone.]—Ed. *Photo. News.*

On the Action of Light through Colored Media.

BY JOHN JOHNSON.

[Read before the American Photographical Society, on March 13, 1865.]

The members will recall that a paper was read before them, more than a year since, on the growth of plants under colored media, and that it was promised at a future day a more extended and careful series of experiments would be undertaken, and the results be laid before the Photographical Society.

Until a recent recent period, no fitting opportunity having presented itself to properly determine anything of value, the subject has laid over, hoping in the interim that some one having better facilities than I possess, would ere this have laid before you details of experiments on this interesting branch of the action of light.

On the fourth of February last I exposed strips of properly prepared albumen paper to the action of light under twelve pieces of variously colored glass; to insure contact, I took a flat board somewhat wider than the pieces of glass, and with proper material covered the board, so that when laying on it a piece of glass, no light would pass under the edges.

The glass used was obtained from Wm. Gibson, Esq., of New York city, and is such as is commonly used in dwellings and churches for ornamentation. The board and glasses with a strip of paper under each, were then placed in a room (at Saco, Me., near latitude 44° N.,) having a south-eastern aspect, in a sofa, in a *horizontal* position where *no direct* sunlight would fall. The actinic effect was noted twice each day. The glasses are *numbered* without reference to color or tint; the numbers merely serve as data for reference. It would have been better had there been enough of the tints to have arranged them in their order of primaries, secondaries, and tertiaries, and therefrom recorded the results; bnt as I did not, and as this is but preliminary to other experiments, we may hope for a more concise and systematic attempt to determine what effect colored media has on the rays of light and heat on the best possible basis for experiment.

Preliminary to the growth of plants under colored media, it seems desirable it should be known whether or no,* actininism really was checked, thrown off, absorbed, penetrated, or transmitted; to determine which the following tints of glass colored by oxides and metals were used.

No. 1. Light blue from cobalt.

" 2. " " curvigated but deeper from cobalt (glass pressed not diamond shaped).

No. 3. Blue from copper.

" 4. Yellow green from copper and uranium.

" 5. Ruby from copper.

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[*] A field for inquiry would seem to be opened as to the action the various oxides have in retarding, changing, or modifying actinism.

" 6. Cathedral green from iron.
" 7. Aquamarine from cobalt and copper.
" 8 Rose purple from gold.
" 9. Rose purple from antimony and gold.
" 10. Deep rose purple from antimony and gold.
" 11. Yellow from iron.
" 12. Pale yellow from iron and zinc.

Half an inch of each strip of paper was exposed during the time to the direct light, the margin of paper merely aiding to draw the strips from under the glass to note what action had taken place beneath.

The numbers left out of the columns are those *full* printed *through* the medium; the order of the density of printing the first numbered in each column.

Feb. 4, 1865.	A.M.	P.M.	Feb. 5,	A.M.	P.M.	Feb. 6,	A.M.	P.M.
	1	1		9	8		6	2
	12	12		7	6		8	3
	7	7		8	9		9	10
	2	8		10	3		2	4
	3	9		3	2		3	11
	6	2		2	10		10	5
	8	6		5	4		4	
	9	3		4	11		11	
	5	10		11	5		5	
	10	4						
	11	11						

Feb. 7,	A.M	P.M.	Feb. 8,	A.M.	P.M.	Feb. 9,	A.M.	P.M.	Feb. 10,	A.M.	P.M.
	2	2		2	2		3	10		4	4
	3	3		3	3		10	3		11	11
	10	10		10	10		2	2		5	5
	11	11		11	11		4	4			
	4	4		4	4		11	11			
	5	5		6	5		5	5			

11th, 12th, 13th, 14th, and 15th, the same order as the 10th.

Feb. 16,	A.M.	P.M.	Feb. 17,	A.M.	P.M.	Feb. 18th,	A.M.	P.M
	11	11		11	11		11	
	5	5		5	5		5	5

From the 19th of February to the 4th of March inclusive No. 5

had continuous exposure to diffused light. On examination after thirty days exposure of the paper under this No. (ruby) the actinic ray deepened the paper several shades. Since the 4th of *this* March it has had an exposure of twenty-seven hours of direct sunlight, and the entire action has printed the paper through the glass to a medium mahogany tint; thus proving that ruby colored glass from copper is the most non-actinic. There may be some question as to the order of the action, inasmuch as that the shades of difference were scarcely determinable.

It may be observed that Nos. 1 and 2 are blue, yet No. 1 fully printed its strip the first day, whereas some days elapsed before that under No. 2 became fully printed; the only difference in the glasses is that No. 2 is curvigated.

On the 10th of February, we are reduced to three samples, and as the action through these glasses was slow, the order of printing becomes marked, and it will be noted that green, yellow, red, at that date are left, and lastly red.

In extending these experiments to the growth of plants, I shall take the blue, No. 1, yellow, No. 11, and red, No. 5, and plant beneath them a variety of seeds under each for a further extension of this investigation.

In connection with the foregoing it would seem desirable to learn something more as to the amount of heat absorbed by the different colored glasses; it would be easy to make thermometer bulbs of colored glass and add thereto stems of white glass for graduation; with such thermometer before us some well marked and useful data could be obtained. I trust that some one will verify these experiments.

Saco, Me., March 9th, 1865.

Editorial Department.

——The Card Photograph is, without doubt, the most reasonable and popular style of portrait yet invented; it has a permanent place in the household. At the present time there are probably in existence more card photographs than other photographs than put together; as many are, perhaps, made in one year, as were made of daguerreotypes in any ten years. . On the centre tables which once ground under the dozens of daguereotype cases, we find only the light and graceful album with its hundreds of pictures. For the picture which shall be common, to be made by the million and for the million, we cannot have anything very different from the *carte*. Any change from fashion or reason will be only a modification of detail, not of principle. The lightness and capability of being stowed away, are the essential elements; and we expect some day, to see this character brought to its last perfection, so that, for example, photographs may be put together as compactly as the leaves in a pocket bible.

This may seem old-fogyish to the enthusiasts on the Opalotype, and the Diamond Cameo, and we hasten to ask pardon. There is room and demand for other pictures; there are walls in our houses for pictures, and there are hanging committees seeking for employment. Large photographs are wanted; we expect some day to hear them much talked about. The capabilities of photography in this direction are not appreciated by any one. And as there is a yearning in the human heart for great things, so also there is for the less; who does not covet the broad acres and also the diamond? Photographic gems are wanted, so small that they may be carried about the person; the greater the cost the better. Perhaps the most fortunate inventor will be the man who finds out photography on fine gold plates, using a solution of pearls for collodion!

Minor Correspondence.

H. R. P., of N. Y.—"Are the iodides and bromide of sodium superior for making negative collodion? Give a reliable formula for their use. ..Where is the best place to buy photographic albums? ..What is the price of the 4-4 Jamin camera?" ....We are not aware that the iodide and bromide of sodium have peculiar advantages. Substitute sodium for potassium in the formula for collodion with iodide and bromide of potassium, and you have a reliable formula. ..See advertisements ..$80, plain; $118 for portrait and view combined.

H. N., of N. J.—"Is there any agent fr the sale of Grubb's Patent Aplanatic View Lenses in this country, or where can I get one? ..Is the Fitz lens a single or double lens, and is it made expressly for views?" ....We know of no agent for Grubb's lenses. You can get one through an importer. ..The Fitz lens is a combination lens, and is constructed expressly for views and for copying. There is nothing better for its purpose.

M. H. PORTER, of Mich. writes, "During the past winter I have practiced coating my negative plates with albumen, sometimes only mixed with water and sometimes I have added iodide of potassium and ammonia. By applying this coating I have been enabled to use much glass that otherwise would have been useless on account of rust. The time of exposure has been less. The details have been worked out better. The collodion adheres closely to the glass and never cracks on drying. The plates are prepared easily and the cost is very much less than when the plates are rubbed with alcohol at its present high price. So far the process works well, but the nitrate bath soon gets out of order and begins to fog, requiring any amount of sunning, boiling down, fusing, etc., to keep it in order. Can you or any of the numerous readers of the Journal suggest an effectual remedy. The process is too valuable to be discarded if it can be made to work uniformly without fogging." ....We know of several others who use a preliminary coating with the same advantages which you have realized. The difficulty you find, however, seems to us insuperable. What do others think? Pure rubber dissolved in benzole or chloroform, we think may be found perhaps as useful as albumen, and will not injure the bath; try it. Although a great parade has been made in England about these preliminary coatings, the fact is they originated in America, and were first described in this Journal.

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[NEW SERIES.]

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Annual Address to the American Photographical Society.

[Delivered by John William Draper. M.D., L.L.D., President of the Society, on Monday evening, March 13th, 1865.]

I do not know that I can comply with our rule, that the President of the Society shall give an Annual Address, in a better way than by offering you thoughts that have frequently occurred to me during the past year, respecting the proper constitution of societies such as ours.

I hear in various quarters, that these associations have not the vigor they formerly possessed, the remark applying not only to ours in America, but also to others in foreign countries. Here, we might suppose, that the continuance of the civil war, which necessarily occupies our attention, is the cause of this diminution of interest, but not so elsewhere.

Twenty-five years ago, when photography was introduced, it was received at first with curiosity, and then with boundless enthusiasm. All lovers of art saw in it an important agent of improvement. Nor did they miscalculate, for undoubtedly it has diffused in all directions a purer and more correct taste. Professional artists alone looked on it with alarm, thinking that it might invade the sanctity of their studios, and carry away their patrons. But that false impression soon wore off, and they became its most zealous cultivators.

Seldom, if ever, has it happened, that a new invention met with such an universal welcome among the public. Photography soon counted among its devotees men, and women too, of all classes. It is affirmed, that among the crowned heads of Europe, there were artists whose pictures proved singular excellence. The professions of medicine, divinity, law, furnished distinguished cultivators, and so a taste for it went on spreading, until it reached those whose apparatus was a cigar box with a spectacle glass in front.

The length of time that the fervor lasted is surprising. I am sure if we had the necessary statistics, we should be astonished at the iodine and mercury and nitrate of silver that were consumed, the cost of the clothing that has been ruined, and of the furniture spoilt A new impulse was given when the collodion process was invented. If the black stains that were received could have been patched together and preserved, they would amount to enough to make no insignificant colony of photographic Africans.

In the midst of all this amateur work, arose that which was more permanent and more important : the cultivation of photography as a profession. In every large town great amounts of capital were invested, establishments in their aggregate furnishing occupation and a means of life to tens of thousands of persons, women and men. In these the art was quickly carried to its utmost perfection. For many years there has been no important improvement in it.

Now one would have supposed, that under such circumstances, photographical societies ought to flourish. And so they did for a time. They concentrated three classes of cultivators : 1st., the professional men, who were following the art as a means of life; 2nd., amateurs, who possessed it as a diversion; 3rd., scientific persons, who devoted themselves to it in expectation that it would lead to an extension of the boundaries of human knowledge.

Even after the first fervor died out, there remained sufficient inducement to all these parties to continue their interest in the societies they had founded. But by degrees a listlessness was observed. The professional photographer discovered, that in his hands the art had reached a stationary condition. His pictures gave satisfaction to his patrons, and what more could he desire? There were to him but two motives that could lead him to dedicate his evenings to photographical societies. These were interest and amusement. As respects the former, the perfection he considered himself to have attained led him to believe that he could employ his time to better purpose, since there was little more to learn, and as respects the latter, he was not to be blamed, for we are all so constituted mentally , that we must necessarily have variations for our thoughts. There comes an intolerable tedium in for ever dealing with the same thing. He who had spent his day laboring in the photographic gallery, must needs have a change. He wanted something different from photography to occupy his evenings.

As to the second class, that of amateurs. I doubt if the form usually given to a photographic society is the most suitable for them. Very many are persons of retiring habits, unused to speaking in public, and therefore reluctant to address meetings where every one is supposed to be an expert. In a more familiar social conversation, these persons open their stores of facts. Frank and ingenuous, nothing is more from their purpose than concealment. They love their art, and are willing that all should learn whatever they know.

The third class who have cultivated photography with objects of science in view are too few in number to exercise much weight in sustaining these associations. Quite commonly the direction their researches happen to take is towards points not generally considered as having an immediate practical application, and therefore in the popular view of less interest.

Such being the elements of which a photographical society is necessarily composed, we may perhaps be fairly led to doubt, whether the organization we gave to ours was really that which subserves our intention best. I incline very strongly to views which have lately been expressed by several members of this society, and on which we commence to act to-night, that for greater usefulness and prosperity it is necessary that that form should be modified. A meeting once a month is too infrequent to keep up active interest. The ceremony hanging about it is too unattractive. Many most valuable members are ill at ease in formal speaking, and hence I adopt the idea, that there is a far greater probability of usefulness and success, if a gallery or museum of our works of art could be made the basis of the association with continuous and unrestricted access for the members. Divested of all formality as much as possibly could be, the communications I will not say degenerating, but rather rising to conversations. In such a manner we should become more closely acquainted with each other. Occasionally, if the opportunity advantageously offered, some appointed officer might call the attention of all present to any thing judged to be of worth, or state in a clear manner any new process or invention that a too modest photographer might not care to announce for himself. The permanent and perpetual acquisition of new works of art will constitute a bond holding us all firmly together.

Of the great advantages of such societies as ours in the promotion of discovery connected with the particular branch they cultivate, no doubt can be entertained. How often it is the case that the happiest suggestions occur to us when conversing with each other. Illuminating sparks are struck out in such mental collisions. Each person having his own special point of view from which he looks at a thing, is able to add somewhat of clearness, where his friend only finds obscurity. Now in photography how numberless are the difficulties we encounter, how many are the problems we desire to solve! On the other hand, how large is the stock of miscellaneons observation disseminated among us! Curious and unexpected facts occur, even to the commencing amateur, the veteran-photographer has accumulated a stock of which too often he does not know the explanation, has reported to others who are in the possession of other facts, in the mutual comparison that ensues the whole truth comes out.

Photography, interesting and extensive as it is, is only a department of a far higher subject, Photo-chemistry—the influences of light in producing chemical action. Within the last four years the attention of the chemical world has been strongly directed to that subject, particularly in the application of spectrum analysis, and it may now be said to have succeeded to the prominence accorded a few years ago to organic chemistry. There is a striking parallel between the condition of chemistry now, and that as exhibited sixty years ago. At that time, every one was occupied with the influence of electricity in producing chemical charges, the Voltaic battery had been invented, the decomposition of water and other substances had been accomplished by its means, soon a great revolution was to occur in chemistry through the decomposition of the alkalies and earths by Davy, the production of metals light enough to swim on water, and even to accomplish the proverbial impossibility of setting it on fire. The nomenclature of the science had to be changed, discoveries crowded upon one another with such rapidity, that in succession many subordinate but yet extensive and mathematical sciences, such as electromagnetism, magneto-electricity, came into existence, the polarity of the needle was explained, and the practical application culminated in the great and inappreciably valuable invention of the electric telegraph.

Now it seems that Photo-chemistry is about to run through the same career as Electro-chemistry, but with the conspicuous superiority at its starting point. When the great development of the latter took place, there was no important, no master fact, foreshadowing the value of what was about to ensue, or indicating the direction that discovery would actually take. With photo-chemistry how different! Long ago it was recognised that the sunlight is the cause of all vegetable organization. The myriads of plants that we see, from the moss upon the wall to the great palms of the tropics, are all children of the sun, the countless combinations they contain, their oils, their acids, their beautiful coloring materials, have all originated in the action of the solar rays. What a world of phenomena have we here, unrivalled in variety and importance! And we must also remember that, even the animal kingdom is affiliated to these facts, for animals find their nutrition in plants, and in turn render nutrition to them. The heat of the sunbeam is the source of the warmth that pervades our bodies, the blush of shame that suffuses our face, the fever that consumes us in sickness. That heat was incorporated in plants, and is restored to the outer world again by animal life.

There is therefore a grand future in prospect for Photochemistry, and that not only as a science, but as an art. Every advancement it makes in the scientific direction, will be quickly made available for his purposes by the photographer. And hence there is every inducement to cultivate it in both these forms.

It is not to be believed, that we know at present the best photographic compounds that exist. The salts of silver were the first to be used, and it may be said that thus far they have preserved their pre-eminence. But they are not the substances employed by nature. It is, in the main, compounds of carbon with which she deals. I look for great changes in our art in this respect, both as regards more truly working material—in which the natural order of light and shade shall be better preserved—and also more sensitive and more durable preparations.

In the change we have inaugurated this evening, by the opening of our new room, and in the necessary modification which will ensue in our mode of proceedings, I anticipate the most valuable results, a reinfusion of enterprise and energy, a new interest in behalf of our beautiful art And I trust that our society will henceforth become more useful, more prosperous, a gratification to us all individually, and a public good.

On the Registration of the Chemical Action of light.

At the meeting of the Photographical Society, on the 13th inst., Prof. Joy of Columbia College, gave an abstract of a paper on the above subject, read by Prof. Henry E. Roscoe, of Manchester, England, before the Royal Society of London, in December, 1864. Prof. Joy remarked as follows :—

Professor Roscoe describes, " A simple mode of measuring the chemical action of total daylight, adapted to the purpose of regular meteorological registration, depending upon the law that equal products of the intensity of the acting light into the time of insolation correspond within very wide limits to equal shades of tints produced upon chloride of silver paper of uniform sensitiveness :—light of the intensity 50, acting for the time 1, thus producing the same blackening effect as light of the intensity 1 acting for the time 50. For the purpose of exposing this paper to light for a known but very short length of time, a pendulum photometer was constructed; and by means of this instrument a strip of paper is so exposed that the different times of insolation for all points along the length of the strip can be calculated to within small fractions of a second, when the duration and amplitude of vibration of the pendulum are known.

" The strip of sensitive paper insolated during the oscillation of the pendulum, exhibits throughout its length a regularly diminishing shade from dark to white; and by reference to a table, the time needed to produce any one of these shades can be ascertained. The unit of photochemical action is assumed to be that intensity of light which produces in the unit of time (one second) a given but arbitrary degree of shade termed the standard tint. The reciprocals of the times during which the points on the strip have to be exposed in order to attain the standard tint, give the intensities of the acting light expressed in terms of the above unit."

A regular series of daily observations can be kept up without difficulty and without regard to wind or weather.

A graduated strip is prepared by reading off, by the flame of a solar flame, the position of these points on each strip which possess equal degrees of tint, the position of the standard tint upon an unfixed strip being ascertained for the purpose of gradation.

Strips are prepared in the pendulum apparatus, and afterwards fixed in hyposulphite of soda.

The results of the observations can be graphically represented by curves.

The amount of chemical action generally corresponds to the amount of cloud or sunshine as noted in the observation. Sometimes, considerable and sudden alterations in the chemical intensity occur when no apparent change in the amount of light can be noticed by the eye.

The remarkable absorptive action excited upon the chemically active rays by small quantities of suspended particles of water in the shape of mist, or haze, is also clearly shown.

On the 20th of June, 1864, the chemical action was represented by 50·9; and on the 22nd of June, 1864, by 119, or in the ratio of 1 to 2·34.

For winter solstice, 4·7; vernal equinox, 36·8; summer solstice, 119; autumnal equinox, 29·1.

From the integrals of daily intensity the mean monthly and annual chemical intensity can be ascertained, and thus we may obtain a knowledge of the distribution of the chemically acting rays upon the earth's surface, such as we possess for the heating rays.

On the Employment of Aniline Colors in Coloring Albumen Photographs.

BY E. JACOBSEN, PH. D.

[Read at a meeting of the Berlin Photographic Society.]

THE colors first prepared from aniline—red and blue—were recommended and used for certain photographic purposes soon after they were practically introduced into dyeing—for instance, by Prof. Seely (*vide* AM. JOURN. OF PHOTO., 1861,)—in combination with a suitable varnish for glass transparencies for the magic lantern, and by albumenised paper makers for tinting paper faint rose, blueish, and violet color, &c. They do not, however, appear to have been employed in coloring paper prints, although their brilliancy and beauty greatly recommend them. It is not unlikely that such experiments attempted with aniline colors on ordinary salted paper deterred from any further trial, as, besides the difficult preparation of individual colors for this purpose, they suffer much, on ordinary paper, in brilliancy and beauty, and, when provided with an unsuitable body, sink into the paper. But, on albumenised paper, aniline colors show the same vigor as on silk or wool; and the reason is simple, viz., that they readily adhere to animal matter—here represented by albumen—and form with it combinations not variable by light or air,—a circumstance which renders them invaluable for coloring photographs, since the greater part of them are taken on albumenised paper.

In the space of a few years a large number of new colors has been added to the few aniline colors originally known, and most of them have been produced in two or more different shades. I have now, after repeated experiments, succeeded in bringing these colors into a form in which they may be applied directly to albumenised paper without any preparation. The colors so prepared by me are in a liquid condition, and contain a suitable body which, at the same time, causes them to adhere to the paper. I have also added to the shades already existing some new ones now first prepared by myself, very applicable to the coloring of photographs; as, for instance, brown, and a color resembling a neutral tint.

One very considerable advantage possed by aniline colors is that they are all transparent, and not, like most honey colors, opaque, so that we also see the exquisite delicacy of the phorograph through the coloring. In combination we obtain a large series of new and beautiful shades—shades, moreover, which cannot be obtained on stuffs by the dye; because the filaments do not take up simultaneously each individual color of those forming the combination. Herr Grashof, member of the Photographic Society, who had the kindness to test the technical use of my colors, speaks of them in the following manner :—

" Aniline colors are beautifully brilliant and delicate, and almost attain the tones of oil colors; they mix readily, and also combine with other colors, and if the colored prints when finished are rubbed over with wax varnish, they attain sufficient permanency against stains, &c. There is another advantage in the colors, that is, of not drying too rapidly, and if they are well diluted, they produce beautiful effects.

" The practical advantages soon make themselves felt in using them. As regards permanency, they leave nothing to be desired. The colors underwent no change—except the green—when exposed to direct sunlight for a week; in a room without sun they continue to appear as brilliant as freshly-applied colors. The green may be easily replaced by a mixture of Paris blue and aniline yellow.*

" When applying the colors take care not to overstep the outlines, since some of the aniline colors cannot be washed off, especially red No. 1, violet, yellow, and brown (light brown No. 1). In coloring a face, first apply the red to the cheeks, and then the other tints; be sure to always dilute considerably the red and violet, faintly coloring the object red at first, and going over it with an equally faint ttnt till it has reached the required depth. All the other colors are, generally speaking, like ordinary water-colors, and adhere to albumen prints, almost without any previous application of glycerine. To graduate the background a little, dilute thoroughly the color employed. Lights on jewellery, &c., may be easily produced by toning down a little baryt-white (not lead-white) with the proper aniline colors; the wax varnish does not rub off these parts, but this application of the lights may be deferred till after waxing, for it is as easy to color on the picture when coated, as before."

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* Indigo-carmine and aniline would be better.

Note by the President, Dr. Vogel :—Some specimens colored with aniline tints were exhibited by Herr Grashof, and excited universal admiration, being little inferior to oils.

Photo-Lithography.

BY E. J. ASSER.

Among the various methods of reproducing the photographic image in printer's ink, the combination of photography with lithography appears to take the foremost place. The aim of photo-lithography is to apply the photographic image to the lithographic stone in such a way that it may then, with the existing appliances, be reproduced in the press. The object to be sought after is, to be enabled to obtain *the largest possible number of impressions, and to preserve clearness of outline* and *delicacy in the half-tones.*

Although the former object has been attained, and the latter qualities—clearness and delicacy—have been already brought to a tolerable degree of advancement, it is doubtful whether the microscopic exactnees of good photographs is capable of being conveyed to the stone; for the difference between the grain of the lithographic stone and the delicate surface of the albumenised paper must be considered, and the thin photographic baths, compared with the thick printers' ink. If, however, photo-lithography sacrifices the extreme delicacy of the photograph, it possesses several advantages which compensate. These advantages viewed in a business light, are *permanency* and *rapid production ;* and, viewed in an artistic light, that all those auxiliaries may be brought to its assistance which have made lithography such a powerful rival of the burin, euch as printing on India paper, and in various colors, &c.

Thanks to all these appliances, the skillful printer has the power, although he loses microscopic sharpness, to heighten the artistic effect of the picture. It happens here, as it usually does with all earthly matters, everything has its advantages and disadvantages.

It will be evident, from the foregoing, that the perfection of photo-lithography is to be reached by seeking for every auxiliary which will facilitate the attainment of sharpness and delicacy.

In its present state, photo-lithography may be divided into two kinds—one of which consists in transferring the image immediately from the negative to the stone; and the other in first obtaining a copy on paper, which is then transferred to the stone.

The latter method may be considered the more practical; it combines several important advantages. The image is transferred positive to the print, becomes negative to the stone, and positive again on the copies. This stone is not used until a good image has been obtained on the paper, and thus, supposing the result were not successful, the trouble of grinding down the stone again is avoided. Moreover, the lithographic ink is then brought directly on to the stone; whereas by the other method, the stone is first treated with bichromate of potash, gum arabic, gelatine, &c., which increases the difficulty of obtaining half-tone, and lessens the durability of the stone.

It will be well to summarise what the photo-lithographer has to strive for to perfect him in his art.

He must clearly understand that photo-lithography differs from photography in this—that while the latter is to be treated almost exclusively mechanically, the former requires a combination of mechanical and artistic skill.

Further, he must be well up both in photograyhy and lithography—quite as much a photographer as a lithographer.

Another important point is the *suitable nature of the negatives*; indeed this is more important in photo-lithography than in the ordinary printing, since every impurity and irregularity is represented with much greater vigor, and consequently rendered more unpleasant to the eye in the impression from the stone than it was in the photographic copy; If the dark parts of the negative (which form the light in the stone) are too opaque, there will be a want of half-tone; if they are too transparent, there will be too much monotony; hence perfectly suitable negatives must be procured.

In transferring the photograph to the transfer-paper, two methods may also be noticed.

The paper (prepared with gum-arabic and bichromate of potash) may be coated with a fatty ink, which may then be washed off with water from the parts not affected by light, or the ink may be applied after the bichromate of potash is dissolved. The latter method has the advantage that the application of the ink need not be left to chance, bnt may be conducted with artistic taste. The former method appears to be adapted only to the reproduction of lines, while the latter is more suited to half-tones.

A question of very great importance is, *What materials should be employed in the composition of the ink?* for the degree of perfection of the print depends thereon. The ink must adhere, even in the weakest half-tones.

Again : it is of moment whether the lithographic stone be hard or soft—whether it must be rubbed smooth with pumice-stone, or corned with sand; this, too, must be ascertained, not generally, but for each particular purpose.

It has been the object of this paper to show that photo-lithography is still only at the outset of its career—that it opens a wide field for research, not only in the province of photography, but also in that of lithography, and that this research will be all the more laborious because the experience of a lithographer is necesary to ensure success.—*Tidjschrift voor Photo.*

The Athmatype.

A CURIOUS discovery was brought under the notice of the public at the Polytechnic Institution (London,) last week. Professor Pepper prophecies that medical results of the highest importance will follow from it.

But however this may be, there is no doubt that it will receive the attention of the faculty of medicine and become the subject of experiment in our hospitals and infirmaries. It occurred to a scientific gentleman—I am sorry to have to confess I forget his name—to examine with the microscope the impressions left on a piece of glass by the breathings of a number of persons; he found that different figures or impressions were made by different breaths. He repeated the experiment, and with similar results. This induced him to make drawings of the impressions, which drawings he submitted to Professor Pepper; and the Professor, ever enthusiastic in the cause of scientific discovery, has had the drawings copied upon glass, and now exhibits them, through the medium of the magic lantern, to the crowds who visit the Polytechnic. I have seen them, and I can assure your readers, that they are extremely interesting in a physiological point of view, and very curious, even as a matter of cursory observation. One of them presents the appearance of a view in a kaleidescope. On the magnified disc presented to the spectators there appear an almost infinite variety of shape and combinations—some like daggers, others resembling stars, others in flower-like form, &c. These represent the breathings of different individuals. Professor Pepper is of opinion that in cases of phthisis (consumption) and other pulmonary complaints, observations on the character of the forms in which the breath is deposited on a glass or other surface, after emission from the lungs, will be most valuable. Certainly, it would be an extraordinary discovery that a diagnosis on the state of one's lungs might be given from a microscopical observation of the particular form assumed by the breath, as deposited on a sheet of glass, on emission from the mouth of the patient! *Corr. of Liverpool Albion*

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The French Specification of the Wothlytype Process.

On comparing the English specification of the Wothlytype process with the corresponding French version, which has just been published, a marked discrepancy in some of the particulars may be observed. The latter is more than ordinarily precise and explicit in matters of detail, and bears so strong a resemblance to the process which we have seen practiced by Lieut.-Col. Stuart Wortley, that we have no hesitation in believing it to be a tolerably full description of Herr Wothly's *modus operandi* in producing those beautiful proofs which have been the admiration of all. But the barbarous Latin names and incorrect chemical terms, by which some of the important details are obscured, detract from its value as a guide to the uninitiated. Having had some experience in the process, we propose giving a short working abstract of the principal modifications mentioned by Herr Wothly, in the hope that it may be found useful by those who wish to experiment in this direction. We shall not be guided altogether by his description, which is in one or two instances incorrect, but to some extent by our own experience.

I.—To Prepare the Uranic Salt.

Dissolve the ordinary commercial nitrate of uranium in distilled water. Add ammonia till no more precipitate is formed. This precipitate is uranate of ammonia, insoluble in water. Wash in several waters, and then redissolve in nitric acid. The solution, when crystallised and dried over a water bath, constitutes the "uranammonium nitrioum" of the specification, and is probably a double salt of uranium and ammonia. If it be very acid, dissolve in distilled water, and again crystallise.

II.—The Sensitising Liquor.

To a saturated solution of the above salt in six ounces of distilled water, add two hundred and twenty grains of nitrate of silver, previously dissolved in one ounce of distilled water, and intimately mix. This mixture, when crystallised over a water bath, is the salt used to sensitise the collodion. It may be kept in a bottle, but not necessarily in a dark place, becouse it is only sensitive to light when brought into contact with organic substances.

Dissolve three ounces of this salt in ten ounces of alcohol, to which five drachms of distilled water and a few drops of nitric acid have been added. This is the sensitising liquor, and does not require to be kept in the dark.

III.—Preparation of the Resinised Collodion.

The collodion may be the ordinary plain preparation, containing about five and a-half grains pyroxyline (not powdery) to the ounce of ether and alcohol, mixed in the proportion of six to two. But, in order to give it an organic reaction with the sensitising salt, it is necessary to add to each pint of the collodion about ten drops of so-called "harz oel," which is thus prepared :—Take equal parts of castor oil and Canada balsam; dissolve the latter in sufficient ether to enable it, when mixed with the castor oil, to pass through a filter. After filtration, evaporate the mixture over a water bath, till it is of the ordinary consistence of a fatty oil. The collodion is now ready for being sensitised.

IV.—To Sensitise the Resinised Collodion.

To every three ounces of the collodion thus prepared. add from one to one and a-half ounces of the sensitising solution, with a few drops nitric acid, and intimately mix. The collodion is now sensitive to light, and must be kept in the dark.

V.—Sizing of the Paper.

This is an important preliminary to prevent the image from sinking into the body of the paper. It is effected either by a tolerably strong solution of starch, Iceland or Irish Moss,* beaten up with about one-eighth of its bulk of albumen and a few grains of acetate of lead. The paper may be floated on this in the usual way, and when dry is ready for the reception of the sensitive collodion.

VI.—Applying the Collodion.

This is very easily done by a method which we have seen adopted by Colonel Wortley. The paper is pinned down by three of its corners to a flat board a little larger than the sheet to be collodionised. The collodion is poured on in the usual way, and the excess run off at the unpinned corner into the stock-bottle. This may be done with great deliberation, and more may be poured on to any part where there is a deficiency, without much chance of its running in ridges. as would inevitably be the case if a glass plate were so treated. Hang up to dry in the dark room, and it is fit for the printing-frame.

VII.—Preliminary Fixing.

When the picture is printed to the proper strength, that is to say, to the depth which it is wished finally to retain—for uranic-developed pictures lose very slightly in the toning and fixing process—place it in a bath containing distilled water, forty ounces; acetic acid, one ounce; and hydrachloric acid, one ounce, for the space of ten minutes. The object of this bath is to remove the uranic salts insoluble in water. The prints are afterwards washed in several waters before being placed in the toning solution.

VIII.—Toning the Pictures.

Herr Wothly refers to several toning solutions of gold and platinum in the hyposulphites, but they are all open to objection from the liability of these combinations to decompose and form noxious compounds, which might injure the print. He also mentions one with sulphocyanide of ammonium, less liable to exception. We have, however, found the *ordinary* alkaline gold bath to answer very satisfactorily, and to tone uranic prints much more rapidly than similar prints on chlorised paper.

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* *Caraghon* in the specification. Carrageen is a local name for Irish moss, and probably that may be meant; but Iceland moss is similar in properties, although the former is a sea weed and the latter a lichen.—Ed. *B J.*

IX.—Fixing the Proofs.

If the picture be toned in hyposulphite of soda and gold, no further fixing will be necessary; but if in the usual alkaline gold bath they will have to pass through a hyposulphite or sulphocyanide solution, to remove the silver salts insoluble in water. When thoroughly washed, the processes are complete.

Besides the above working compendium, of the principal noticeable points in the Wothlytype process, Herr Wothly in his specification indicates many modifications, which, for special purposes, may be found very useful. We have not space to dwell upon them at present but may do so on a future occasion, when we have had time to go through the necessary experiments.—*Brit. Journ. of Photo.*

A Name Wanted.

Mr. Editor—In a late number of your Journal, you made some remarks in reference to the names given to the new style of photographs made on white semi-transparent glass. The names you mention in the article alluded to, as being used by some in New York, I think they are not quite the thing, and yet I would rather see either one of them adopted than the ridiculous cognomen given to them here, which you may have heard, photo-miniature! How very expressive! Photo, as every body knows or should know, is simply an abbreviation of the word photograph, and consequently will apply to any picture made by the agency of light, and so will also the word miniature, except when life size. How would it do to call a life-size picture a miniature? In that case the word miniature would have to be dropt, and it would then be photo-life-size, which would mean a life-size photograph, but would convey no idea of, nor designate any particular style. To me it is like a man naming his two sons one Joseph, and the other Joe.

To be serious, it must be admitted by any intelligent person that photo-miniature is not a suitable name for any particular photograph, and especially for this elegant one, which I think should have a name worthy of its rare beauty. M. P. SIMONS.

PHILADELPHIA, Pa., March 16th, 1865.

Carbon Proofs by Direct Printing.

BY M. CAREY LEA.

M. GAUDIN has recently published a statement in *La Lumière* to the effect that the practical possibility of carbon printing will lie for general use in direct printing, that is, that the negative shall be applied directly to the carbon surface, and the unaffected parts be washed off without transferring. Both in the original Fargier process, and in Swan's modification of it, the principle is that the surface which has been in contact with the negative, shall be attached to a support, and then the development by washing is made at the back, and it is precisely this that give them their exquisite gradations of half tint. This M. Gaudin recognises, but thinks it impractical and not indispensably necessary. Now I gave this subject a very careful study a year ago, and believe I understand it well, both as to its possibilities and its short comings, and I believe M. Gaudin to be wrong, and to be going on a false system.

M. Gaudin endeavors to prove his position by an assertion, for which however I cannot find that he offers any proof, that in the daguerreotype, and the chloride print, the picture is formed by particles in *juxtaxposition* and not *superimposed*, that is, that the image is formed by but a single layer of particles. This view is so evidently erroneous that it is not worth while to argue upon it. But proceeding upon it, M. Gaudin applies to paper a very thin stratum of lampblack and bichromated gelatine, and then proposes by direct printing to obtain satisfactory pictures with half tone. He claims to have obtained very satisfactory results already without having finished his experiments.

As I have just said, I have worked at this process conscientiously, and believe I have developed whatever capacities it has. I have made prints, not by scores, but by hundreds, and did not confine myself to gelatine, but experimented thoroughly with gum also. The connection which I reached both theoretically and pra tically was as follows.

Instead of taking a negative, let us take half a dozen pieces of paper each a little smaller than the last, and lay them over each other so that on space 1 there will be one thickness, on space 2 two thicknesses, and so to space 6, where there will be six, and let us suppose that the thickness of the paper, and the light used is such that space 6 is quite opaque, 5, nearly so, and so on through the half tints until we come to 1, which is nearly transparent, and space 0, where nothing is interposed.

Now when the carbon surface is exposed to the light under this scale of tints, the light begins to act from the surface down. At space 0, where nothing was interposed, the light works its way down to the paper, and in the development, this space is dead black. At space 1, we will say that the light also penetrates to the paper and this space is also rendered by black in the development. But in space 2, the light has not had quite time to reach the paper, but has gone regularly down perhaps five-sixths of the distance. Yet not having reached the paper, there is no attachment to it, so space 2 cakes off in the development; and so of 3, 4, 5, and 6. Consequently, the developed image shows nothing but black and white, more of the former and less of the latter, just in proportion as the exposure has been prolonged, and no half tints-

Or rather, this would be the case, if we had an absolutely smooth surface to go upon, and could apply the coloring matter with absolute evenness. But our paper is rough, and in coating it with the sensitive mixture we cannot put it on with more than a moderate evenness. So that space 2, for example, will not in practice wholly cake off. Supposing it even to have a perfectly smooth upper surface, its under surface will have all the irregularities of the payer, and in thousands of points where the paper is infinitesimally higher, the light will penetrate and fasten the carbon to the paper whilst in thousands of slight depressions, penetration will not take place, and the whole color will wash off from those depressions. This will naturally produce a kind of imperfect half tint within certain limits, something like a lithographic grain, and having no resemblance to half tint as obtained with the usual photographic processes, or with Swan's, or Fargier's carbon methods.

The defects which I here describe are precisely these which I encountered in my work. I was determined to make it succeed, and spared no pains, but I finally came to see that the trouble was inherent in the very nature of the process, and could not be got rid of by any niceties of manipulation. Where the negative consisted wholly of black and white, and was strong and clear, I succeeded very well, as for example, in the reproduction of engravings full size. This I could do, even with very fine bank-note engraving, almost equal to silver printing. I even obtained as above explained, a certain sort of modified half tone, and could make some sort of an attempt at printing views, but the proofs were very poor.

My final preference was for gum rather than gelatine, though I could work equally well with either, and the two substances require very different treatment. Gum is far less sensitive than gelatine, but both are so very quickly acted upon by light that the difference is unimportant. Gum must be developed with perfectly cold water, and requires delicate handling, but there is perhaps less danger of overprinting than with gelatine. The setting of gelatine makes the application to paper more troublesome; sometimes it will begin to set at the very moment when one is trying to brush it perfectly smooth. Gum is free from the annoyance. By using the gum in powder, which I always did, the materials may at any time be ready for applying to paper in a very few moments. I do not like lampblack for this purpose. I prefer graphite, in that exceedingly fine condition in which it is sold for electrotyping purposes. To judge of the thickness of the mixture, it may be brushed on a bit of sized paper on which are printed large letters. These should be *almost* but not quite wholly concealed when the black mixture is brushed moderately over them.

When bichromate of potash is used, the paper is exceedingly uncertain as to its keeping properties. Sometimes it will not keep twelve hours, and it is always best to prepare it immediately before using it. But as I have lately shown, by substituting the chromate of potash and ammonia, a paper is obtained, sufficiently sensitive, and remaining good for forty or fifty days.

Even suppose M. Gaudin's view were true, and that he could obtain a layer containing a single range of particles, as he considers such a layer, would he be any nearer to the object than before? I think not. For in all those half tints in which the exposure was sufficient to penetrate the mass of color, the effect would be dead black, whereas, where the light did not penetrate, white tints would be got. These results would be varied somewhat, and partly masked by the thickness and texture of the paper. But it appears to me (and I say it after unwearied trials) idle to expect to get really good half tones with carbon, except by reverse printing, a fact which seems to have been fully appreciated by Mr. Blair, Mr. Pouncy, M. Fargier, and Mr. Swan.

In fact we have only to reflect on the nature of the image produced by the action of the sun through a negative upon a sheet of bichromated gelatine, with or without carbon, to perceive that it is like a cameo, turned upside down, the design buried in the unaffected parts of the film. And all these portions in which the action of the light has not reached the paper (to wit, the half tones) are *unsupported in the development*, and must be detached and lost.

PHILADELPHIA, Pa., March 15th, 1865.

The South Light a Success.

BY JOHN ESMAY.

MR. EDITOR—I see some enquiry by a subscriber concerning south lights. I will give my experience, and if it will add anything to what has already been said, or published, with reference to the subject, you may publish it in your Journal, if not, cast it under the bench with the *bal.* of the scraps. Some readers of your valuable Journal, may be situated as I have been, on the south side of a taller building than the one I occupied, completely over shadowing my skylight, which was on the north side of my room. I like many others, thought I could not use anything but north light, and in the winter season was left in the shade.

I worked away in this manner about two years, and used to dread to see customers come in, especially children; not that I did not know how to make a good picture, as I had followed this business pretty successfully for ten years; but I had no light.

I first saw the south light recommended in the Journal,—this kindled a beam of light in my mind. I had about made up my mind to build another room, where I could get a side light to combine. I resolved to try the experiment of south light; next thought ground glass or blue glass was not easy to get; so I shifted my light to southward and combined a side light down to the floor, used nothing but common white glass, window glass; fitted up double screen of blue cambric hung on wire, to slide one or both, as circumstances might require; the same overhead double, and to slide, as occasion might require.

I have two hundred square feet of glass in my light, facing direct south; and I must say that I am indebted to the editor of the Journal for as good a light as there is in the state of Iowa. It is a complete success. Brethren in the art need not fear the south light,—the idea that nothing but north light can be used is done away with.

SABULA, Iowa, March 10th, 1865.

The American Photographical Society.

SIXTIETH MEETING.

THE Society met at its rooms, No. 907 Broadway, March 13th, President DRAPER in the chair. O. G. MASON, Secretary.

The minutes of the last meeting were read and approved.

The report of the committee on ways and means was read and adopted.

Mr. RUTHERFORD moved that the suggestions of the report be accepted and the committee discharged.

The committee on membership reported for election to D. C. Chapman, 392 Bowery, and J. W. Morgan, 211 Washington street, who were unanimously elected.

President DRAPER read to the society a letter from Mr. M. Carey Lea, of Philadelphia, tendering his thanks to the society for the honor conferred upon him by his election as honorary member;

also calling attention to the exhibition of the Photographical Society of Berlin, Prussia.

The following resolution was adopted :—

" The American Photographical Society feel a lively interest in the exhibition of the Photographical Society of Berlin, and will do what lays in its power toward contributing specimens of American photography."

Mr. Mason called the attention of the society to suggestions which had been made by several members, in regard to the collection and exhibition of photographical productions by the society, and hoped that the members would contribute to the call from Berlin, as he felt sure that the Berlin Society would be able to contribute to any exhibition which the American Photographical Society might make. He advised the forwarding of plain photographs either portraits or views. Certainly the views, if not valuable as fine specimens of the art, would at least have the novelty of foreign scenery.

Professor Seely moved that a committee of three be appointed to select and receive contributions, and attend to the shipping of the same.

The President appointed as such committee, Messrs. Hull Mason, and Bogardus.

The society then listened with interest to the President's Address.

Professor Seely gave details of experiments with zinc, with the view of producing artificial light suitable for photographical purpose, and as an illustration, burned a small sample of the preparation of zinc which he had used. He proposed the use of other metals in the production of suitable light, and would continue his investigation by the use of antimony, &c.

Mr. Tillman read a paper upon Clydonics.

Professor Seely then read a paper contributed by Mr. Johnson, of Saco, Me., entitled, Action of Light when transmitted through a Colored Medium.

Prof. Joy gave an abstract of a paper contributed by Prof. Roscoe, of Manchester, England, on the Measurement of Light.

President Draper called the attention of the society to the fact of a paper having been read at one of the early meetings of the society by his son, Dr. John C. Draper, whose plan for determining the intensity of light was by its precipitation of gold.

Professor SEELY called attention to a method of determining the amount of nitrate of silver in solution by the use of iodide of potassium. The use of nitrous acid and starch proposed by Dr. Vogel, gives a very correct and quick method of determining the amount of silver in solution.

Mr. HULL called up the matter of having one or more informal meetings during each month. After some discussion Mr. Hull proposed the fourth Monday of each month as the time for the informal meeting of the society.

Upon motion of Mr. THOMPSON the thanks of the society were tendered to the committee of ways and means, for the able manner in which they had discharged their duties.

President DRAPER called attention to the elevating of the most refrangible rays of light, especially those used in photography—the blue, purple, and violet. He thought that photography might receive considerable aid from the researches being made in that direction.

Mr. WETMORE exhibited a series of views, recently made in Georgia, by Mr. Koonley.

Mr. GORDON exhibited a very fine camera box for card work. The box attracted considerable attention and was highly commended by several members.

The society then adjourned to the second Monday in April.

Editorial Department.

——— We are informed that the Wothlytype process is to be patented in the United States, and that the patent right has been disposed of for a large sum of money. The purchaser is not a photographer, and is probably not very well informed of his prospects of pecuniary success. The profession will please to be prepared for a sensation.

The Wothlytype process has little chance of successful rivalry with the ordinary methods on the score of economy of cost of materials and labor, at least for the daily business of the practical photographer. It however furnishes a quick and easy means of sensitising paper, which is sometimes desirable, and especially to the amateur ; the prepared paper may be coated with collodion and got ready for printing in a moment. The proprietors of the patent can only expect success through showing that their process yields superior results ; they cannot make cheaper photographs than we, let them show us better.

Our readers we believe now have had the full particulars of the process, and those who desire can for themselves practically test its utility and determine if they want to invest in the patent.

——We are much gratified to learn that photographers are beginning to appreciate the advantage of foccussing glasses. Those of defective vision, as soon as they know what they are, will consider them indispensable, and others will find out that good eyes really need assistance. Any person who has once properly used a focussing glass will be unwilling to dispense with it. We anticipate the time when the focussing glass will be as constant an attendant of the camera as the focussing cloth is at present.

Minor Correspondence.

Mr. CHASE, of Newark, O., favors us with the following valuable processes :—*Liquid Chloride of Gold*—Dissolve two gold dollars in four drachms of aqua regia, in a clean glass bottle; when dissolved add thirty-two ounces of pure soft water; this will make the gold one and a half grains to the ounce. When wanted for use, take the quantity of gold needed and add soft water enough to tone the prints and neutralise with bicarbonate of soda until it turns litmus paper blue. This acid chloride of gold will keep any length of time. —*To Silver large sheets of Paper*, with a small quantity of silver solution. Make a lath frame a little larger than a sheet of paper, and cover it with muslin stretched tightly ; turn up the edges of the paper a quarter of an inch all around, and fasten the corners with patent clothes pins, this will make a tray of the paper which can be laid on the frame and the silver poured in, keeping it in motion until silvered ; by removing one of the pins the solution can be poured into a graduate.

R. N. L , of Ky.—Methylated spirits or wood naptha is not yet manufactured to any great extent in America. It has most of the properties of alcohol, and for some purposes it is a complete substitute. In photography it appears however not to have met with much favor.

S. R., of N. Y.—Any ordinary negative copying arrangement will answer for the porcelain pictures. If you have not one on hand, we advise you to get an extension bellows for your 1-2 or 4-4 box. The Fitz, or the Globe lens, is without doubt better than any portrait lens for the printing in the camera.

A. N., of Mich.—Nitrate of uranium for the toning bath seems pretty generally to have been abandoned. Toning is effected by the noble metals only.

C. A. P., of Tenn.—"Having had a quantity of scraps of paper, filters, &c., containing silver, I concluded I would attempt to run the same in the form of a button in order to make nitrate from the metal. I succeeded in obtaining the button with a black and greenish coating on parts of it. I then cut the same with nitric acid, but could not manage to crystalize the remains; it formed a sort of crystals but not transparent, being of a greenish color. What was the cause? impure acid? A treatise states it denotes the presence of copper ; but I am at a loss to know from whence it came." . . . The green color is probably due to copper. Remember that pins and scraps of mats and preservers contain copper, and perhaps you can account for its presence. A pin in a lot of waste paper is like a needle in a haystack, but when you have the metal from paper by itself, the pin may be apparent enough. You are more careful than others if you succeed in keeping copper and iron out of your silver waste.

D. H. B., of Ind.—"Please inform me through your next Journal, if there is not a mistake made on page 302, in developing formula ; where it reads sulphate of 'iron,' should it not read suphate of copper?" . . . . It should read "sulphate of copper."

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On the Action of Light upon Iodide of Silver.

BY M. CAREY LEA.

Iodide of silver formed in presence of an excess of alkaline iodide is known as the "insensitive variety," and this supposed insensitiveness has been considered as one of the well established facts in photographs.

Some investigations which I have lately made, have led me to the conclusion that this view is erroneous, and that iodide of silver, however formed, is always sensitive to light. That consequently, the difference between the two sorts is one of degree and not of kind.

Dr. Vogel concludes from his investigations upon the action of light upon the silver haloids—investigations which constitute the most valuable additions to scientific photography that have been made for many years—that whilst the chloride and bromide of silver are reduced by the action of light into sub-chloride and sub-bromide, no such change takes place with the iodide. Pure iodide of silver whether formed in an excess of silver salt or of iodide exposed to light in tubes, gave off no iodine. Its splitting up into metallic silver and a superiodide was disproved by the fact that no metallic silver could be found in the mass after exposure. Dr. Vogel's conclusion therefore seems to have been justified by his experiments: that the action of light upon iodide of silver is altogether physical, and entirely distinct from any chemical change.

If the action of light upon iodide of silver were chemical, and if it could be shown that chemical decomposition took place only in the case of iodine prepared in presence an excess of silver salt, we should at once see a reason why light should not act upon that variety silver called hitherto "insensitive." But as both varieties withstand the chemical action of light, there is no *à priori* reason why one should be sensitive and the other not so.

And this difference does not exist. Why there should be so great an inequality in the sensitiveness as there appears to exist, it is not easy to say; but that iodide of silver formed in presence of excess of alkaline iodide does exhibit a well marked sensitiveness and a capacity to form a latent and developable image I can say with certainty.

I shall proceed to state the experiments which have led me to this conclusion, briefly.

1. A piece of paper was flowed over with a solution of nitrate of silver and dried. It was then floated upon a solution of iodide of potassium, well washed, dried, and exposed under a negative, for five seconds to direct sunlight. A developer of pyrogallic acid and silver brought out a faint but distinct image.

2. Paper was flowed over with a fifty-grain solution of nitrate of silver, and dried. In experiment 1, the paper had been floated only on the bath of iodide, and it seemed possible that the iodide might not have thoroughly penetrated and decomposed the whole of the silver salt. In this experiment therefore, the paper was entirely immersed in a twelve-grain bath of iodide of potassium, and left there four minutes. It was then well washed, and exposed wet, under a negative for twenty seconds in sunlight, and developed with gallic acid and silver. A distinct image came out, but only in irregular spots,

3. Same precisely as the last, but developed with iron developer, and with same results.

4. Same with an exposure of six seconds. Developed with iron and silver, nothing whatever came out. (This was an exceptional result, not depending upon the shorter exposure as will appear hereafter.)

5. The same paper was exposed under the same negative for one minute in tolerably strong diffused light. It was next moistened with silver solution and citric acid. Finally an iron deve-

loper was applied and a moderately strong picture was brought out.

6. A piece of the same paper was exposed to the same light under thesame negative, and for the same time. It was then given a short development with iron and silver, washed, and a developer of pyrogallic acid and silver flowed over it. The result was a weak picture, with the light and shades reversed—that is, it was a paper negative, the shades corresponding to those of the glass negative; The portions which had been acted upon by light remained white, and those which had been protected from it took the silver and formed the shades of the picture. It is not easy to account for this result. See also below.

7. A piece of the same paper was exposed under the same negative close under an argand gas burner, and was kept there fifteen minutes. An iron developer with silver brought out nothing whatever.

8. The experiment was repeated; a short development with iron was made, and followed by a pyrogallic development. Nothing resulted.

In all the foregoing experiments, except where expressly otherwise stated, the paper was exposed under the negative, wet.

The foregoing experiments, with others similar, appeared, notwithstanding an occasional exceptional insensibility, to be tolerably decisive. In reviewing them to seek out any possible source of error, it occurred to me that it might possibly be objected that the decomposition of the nitrate was not complete in the time allowed, and that there might remain exceedingly small quantities of iodide of silver present, which had continued to be in contact with free nitrate. Such a supposition seemed to me in the present case to be in the highest degree unlikely. Major Russell affirms as the result of investigations very lately made by him, that when a collodion plate is immersed in the nitrate bath, a certain proportion of the alkaline iodide or bromide escapes decomposition for a considerable time, (especially in the case of bromide), and that it very often happens that when the plate is removed from the negative bath, there remains a portion of undecomposed alkaline salt at the back of the film. Evidently in the case of paper, this could not so easily happen, especially when the paper is wholly immersed.

In order however to remove all possibility of uncertainty, a fresh portion of paper was prepared with a fifty-grain solution of nitrate of silver. A bath of iodide of potassium of about fifteen grains to the ounce was fully saturated with iodide of silver, inasmuch as the prolonged immersion which it was intended to give, would otherwise have tended to dissolve a large part of the iodide of silver formed in the paper.

The silvered paper was immersed in this bath, taking care that the quantity of the bath was largely more than sufficient to decompose all the silver salt in the paper. In this bath it was left *three hours*, a period which must remove every shadow of suspicion as to the existence of an atom of nitrate of silver in the paper It was then washed for an hour and a half in running water, and was used for the following experiments.

9. A portion of this paper still wet, was exposed to direct sunlight for three seconds. A solution of nitrate of silver and citric acid was poured over it, and then an iron developer was applied. A strong and distinct image was brought out.

10. Exposed seven seconds to sun, under the same negative; then dipped into the negative bath and developed with protosulphate of iron, acetic acid, and citric acid. A visible image was obtained, but much fogged.

11. Same paper, exposed one and a quarter minutes to diffused light. An iron developer forced out with great difficulty a faint image reversed—a negative instead of a positive.

The foregoing results appear to be tolerably conclusive, but upon a careful review of the whole question, there appeared to be one possible source of error still left. Nitrate of silver forms with certain organic bodies, compounds of peculiar nature and which strongly resist decomposition. We know that the compound thus formed with albumen resists the fixing agents commonly employed We know too that nitrate of silver forms a compound also with gelatine, a substance which enters largely into the sizing of many sorts of paper. Now it might possibly be objected that such a compound might have been formed within the paper used. We also know that the sensibility of the silver haloids is heightened not only by the presence of free nitrate of silver, but by that of many other silver salts, insoluble as well as soluble. If then a compound of silver and gelatine or other organic matter were present in the paper, it might be objected that the iodide owed its sensibility to the presence of that organic salt.

Although such a supposition appeared extremely improbable, it was thought necessary to test the question by actual experiment. We know that collodion does not form a compound with nitrate of silver. Collodion seemed therefore a proper foundation for supporting the layer of iodide to be tested.

The first attempt was made by coating a glass with plain collodion, and immersing it in the negative nitrate bath. It was then drained and placed in the bath of iodide. Very little nitrate seemed to have entered the film and the plate was rejected without exposure. To obviate this difficulty, a collodion was prepared containing nitrate of silver. With this the plate was coated, and was then immersed in a bath of iodide of potassium already saturated with iodide of silver. Considerable difficulty was experienced in getting a tolerably smooth plate in this way, the tendency to irregularity seeming to be very much greater than when the iodide is in the film and the silver in the bath.

To insure the perfect decomposition of every trace of nitrate, and leave no opening for cavil, the plate was left nearly three hours in this iodide bath, with occasional agitation. It was then thoroughly washed, and dried.

Experiments made with films prepared in this way showed that the sensitiveness was the same as where paper was employed. As far as could be observed, there was no difference in the impressibility of the film. About the same exposure was employed, (three seconds in the sun under a strong negative seemed to give the best results,) and the same mode of development, and with similar results. The image was sufficiently strong to admit of the plates being fixed with hyposulphite of soda, without injury to them.

The iodide of silver showed some tendency to wash from the film, when the plate was placed in the iodide bath, probably because too much silver salt had been added to the collodion. This iodide was sometimes abundant enough to form a continuous film on top of the collodion. This external layer was then entirely free from the presence of anything like organic matter, more so than perhaps could have been brought about intentionally in any other way.

It therefore became especially interesting to observe how this exterior layer would conduct itself to light. It was found to receive the latent image at least as easily as the portion enclosed in the film, to which it adhered mechanically sufficiently well to permit of developing, and even to some extent, of fixing. But when an attempt was made to wash, after fixing, in a current of water, nearly the whole of the layer and the image disappeared.

Here I think we have an absolute demonstration that iodide of silver, quite free from organic matter, and formed in presence of excess of alkaline iodide, is capable of taking the latent image. The experiment as here last described, seems to leave no loophole whatever for doubt. Iodide of silver, itself formed in presence of excess of alkaline iodide loosely lying upon a surface, and left for hours in presence of excess of that iodide, is, when thoroughly washed, capable of receiving a latent image which develops with considerable strength, and might doubtless exhibit much more vigor if all the needful conditions were carefully studied, as they have been in the case of the usual method.

Another and a final experiment remains to be recorded which possesses a particular interest in a theoretical point of view. In fact the sole interest attached to the whole of the foregoing is necessarily theoretical. The images obtained are wholly inferior to those got with the ordinary method, and are apt to be rather foggy, that is, the development must be carried to the verge of fogging, to bring them out. Generally it is advisable to add citric acid to the iron developer, though this is not always necessaay,

In the experiment which I am about to describe, a piece of paper imbued with a fifty-grain solution of nitrate of silver, dried, and plunged into a bath of iodide of potassium for a brief space, and then simply blotted off with bibulous paper, and exposed while still moist with the iodide solution, under the same negative, for the same time, and developed in the same manner. This paper proved to be absolutely insensible. No trace of darkening could be perceived.

What are we to conclude from this? Is it then possible for iodide of silver to be insensible?

Vogel has pointed out that if a plate of ordinary very sensitive iodide is exposed to light and receives an image, and is then washed over with solution of alkaline iodide, the physical condition of the iodide is altered, and the *capacity for development* of the image destroyed.

If then iodide of silver is capable of destroying the capacity for development when applied after exposure, we have no difficulty in understanding why its presence in the free state in contact with the iodide, must prevent the formation of any latent tmage.

Many controversies have taken place, and much argument has been employed in endeavoring to account for the alleged insensibility of iodide of silver when formed in the presence of excess of alkaline iodide, and it has been insisted that this insensibility depended upon the retention o a minute portion of alkaline iodide not removable by washing, the presence of which, it was alleged, gave rise to this insensibility. We now see, first, that the alleged insensibility does not exist at all; and secondly, that none of the iodide can be retained after a proper washing, because if it was retained, the iodide of silver would be thereby prevented from receiving the latent image. The experiments already detailed show that such an image is most undoubtedly received. It therefore follows that alkaline iodide cannot remain present with the iodide of silver. This view must therefore be abandoned, and it is a little curious to observe what vehement discussion has occurred as to the explanation of the cause of an insensibility which has no existence.

I described not very long back, a series of experiments on the effect of ozine developed by chemical reactions (slow combustion of phosphorus, and action of sulphuric acid on chameleon mineral) upon iodide and bromide of silver prepared in the presence of excess of the alkaline salt. In these experiments I employed exposures of a length based upon those given for ordinary negative development, and in no case very greatly exceeding them. It now appears that those exposures, to have brought out the sensibility described in the present paper ought to have been materially prolonged.

It was my intention to have resumed and repeated these experiments with the further light that I have since obtained. But I have been deterred from doing so, by the great irregularity which marks the results in the experiments described in this paper. It would constantly happen that two pieces of paper prepared as nearly as possible in the same way, or even two pieces of paper cut from the same prepared sheet, and exposed successively under the same negative, to the same light, and for the same time, and developed in the same manner, would give quite different results. Under these circumstances, to introduce another new agency and to expect to obtain conclusive comparative results would be out of the question. I did indeed make one or two experiments, by dividing a piece of paper into halves, exposing one half to the action of ozone (generated by the slow combustion of phosphorus) for a certain time, then placing them both under the same negative, and exposing and subsequently developing them together. These results, so far as they went, corroborated my previously expressed conclusions, that ozone so generated does not heighten the sensibility of iodide of silver formed in the presence of excess of alkaline iodide. But I am by no means disposed to attach too much weight to one or two experiments. It would be necessary to repeat them oftener than I can do at present, to arrive at a positive result. I can simply aver that the half of a piece of paper which was exposed for five minutes to the action of ozone, developed exactly like the other half which had not been so exposed. In fact in the present examination, I have had but a single object in view, the settlement of the question as to whether the so-called "insensitive" iodide of silver really deserved that appellation. I think it is apparent that it does not, and that, as I before said, the two varieties of iodide of silver differ in their properties, not in kind, but in degree.

The relations to light of *bromide of silver* have been less studied than those of the other silver haloids. Especially of bromide of silver formed in presence of excess of alkaline bromide. We know indeed from Vogel's extended researches—researches as valuable from the plain, clear, and logical manner in which they are presented as from the experimental skill with which they were conducted—that bromide of silver when exposed to light disengages bromine very easily, with formation of sub-bromide, differing in this essentially from the iodide, which exhibits no such reaction.

I do not remember to have met any expression of opinion as to whether simple bromide of silver formed in presence of alkaline bromide and not modified by subsequent treatment, is capable or not of receiving a latent image, susceptible of development. That it is capable, experiments of my own leave me in no doubt. However its chemical reactions under the influence of light may differ from those of iodide of silver, its capacity for undergoing the physical change which leads to the production of a latent image, is the same.

PHILADELPHIA, Pa., April 10th, 1865.

The Study of Art Necessary to the Photographer.

BY CALVIN THURBER.

In portraiture a good negative depends upon three things, viz., a proper disposition of light, an appropriate attitude of the model, and a good chemical effect. The degree in which the first two conditions are fulfilled must depend upon the amount of artistic feeling possessed by the operator, and a failure to meet those conditions in some degree is proof of a deficiency in those fine perceptions which must ever mark the true artist from the mere mechanic.

But when we come to consider the very slight attention bestowed upon the subjects of light and position in a really artistic sense, we are surprised at the degree of merit which we many times find displayed, though this merit only goes to prove the yet undeveloped powers of our noble art, for its exhibition is the exception, not the rule.

Among students of painting the art of light and shadow is considered of no less importance than that of color, and it is entirely just that it should be so; for it is upon that happy arrangement of light and shade that the artist must depend for vigor, relief, and all life-like effect, for all pictorial attempts owe their chief value to that felicitous disposition of light that shall give to each individual part of the picture its proper emphasis and force.

It is a knowledge of the subtle powers of chiaroscuro, or the science of light and shade, united with correct perceptions of form, that will ever be sufficient to place a man in the first rank among painters. Without this knowledge, though he may be able to color like a Titian or a Claude, still the simple abilty to color will fail to confer immortality upon his works, or true greatness upon himself.

Now there is no branch of art where art of light and shade plays a more prominent part than in photography; everything depending upon it and upon form, for no defect can there be glazed over by a veil of deceptive color; everything there is simple, severe, and straightforward truth, and the least departure from that truth is painfully felt

Yet, notwithstanding their importance, photographers seem to have bestowed very little attention upon the subjects of light and position, or at least, not that attention which they deserve. Few of them have thought worth their time to study the works of the masters with the direct object of applying the results of those studies to their every day practice. It is true that the class is comparatively small who can have the advantage of a systematic course of study from the originals of the masters and teachers of art, but the land is full of worthy copies, good engravings which embody all that is of value to the photographer. Our print-stores teem with a host of subjects worthy of our attention, as regards light, shade, and position.

To prove the importance of this branch of study to our art, we have only to compare a poorly lighted and poorly positioned photograph with some fine copy of a Reynolds, or a Lawrence, and we shall see at once what a field we have to traverse before we can attain to that exquisite combination which we find in those copies. In the copy there is not a shade that can be taken away without detracting from the beauty and perfectness of the whole; not a light that can be marred without destroying the completeness of beauty, for they are all, even to the slightest touch, the result of an extended knowledge, growing out of a life-long study and experience. I am confident none will deny that the work from the camera is susceptible of being made as beautiful and truthful as that copy of Reynolds, or Lawrence.

It is true that the air of exquisite refinement, of dignity, of noble pride, or tender love, with which the master's pencil can invest his work, the photographer cannot always hope to attain, for every model with which he has to deal is neither a nymph or a hero—nor are they all even graceful men and women. But, notwithstanding the fact that all sitters cannot be posed in strict accordance with the laws of classic beauty, still I claim that in every individual there resides a certain gracefulness and dignity which will show itself when they feel at perfect ease, and it therefore becomes of no small importance that the operator should have the tact to place his sitter at perfect ease; and if in addition to this, he distinctly knows what a truly graceful position is, he will almost invariably catch the best position which the sitter is capable of assuming.

The quality of imparting to the sense of ease and freedom must depend upon a native politeness carefully cultivated, united with an intimate knowledge of human nature, that instantly understands the particular treatment required by each individul case. This knowledge and politeness can be gained only by careful study and constant practice.

That other quality, of knowing what the truly beautiful is, can be made ours only by patient study of the best specimens of art that may come within our reach, if not the original paintings, then the best copies of the best artists, remembering that the disposition of light, and the grace of position, which we there find, is the result of the accumulated knowledge, observation and experience of ages, and of an extended study, such as the practical photographer could never find to follow out by actual experiment.

WARREN, R. I., April, 1865.

Binary Pictures.

BY J. BOCKETT.

(Read before the North London Photographic Society, March 22d 1865.)

As I though it not unlikely that some of our members might wish to take some of these peculiar cartes, I have brought with me a camera which I have adapted to the purpose. Although an allusion was made to shutters fitted to the interior of the camera, which were not to overlap, no definite instruction was given as to the space to be left between them. I shall simply describe the camera before you, and also the four experiments made.

The portion of a camera in which the back slides, is perforated top and bottom with two holes, in order that two shutters of zinc or wood, properly blackened, may be moved by means of brass milled heads upon the top of the instrument inward towards the lens: the milled heads are to be sufficiently long to have a slot cut in them, which takes hold of the upper part of the flap, and can either be soldered or fitted with a screw. Of course, the one grand thing to be obviated is the dark or light line in which will appear in the negative if the apparatus is not properly made. In the first attempt, the zinc doors were one-sixteenth of an inch apart; this gave a white line as in card No. 1. A ttempt No. 2 was made with one shutter placed at an angle, the other just partially shading the edge thereof; this gave a dark line. In the third trial, the shutters were made to overlap, which gave a line harder than all. I was somewhat troubled to know how I should fit an adjusting plate so as to increase or diminish the slit when the two shutters were closed; this is effected by bending a piece of metal over so as to slide stiffly upon one of the plates. In the last and successful trial, the edges of the shutters are chamfered off, and pins fitted to the bottom of the camera, so as to allow the edges almost touch, but not so absolutely. In an instrument made for the purpose, I should certainly think that sliding pieces should be fitted with four slots and screws, in order that a perfectly central line of light may be obtained, and any necessary adjustment made. There also appears to be an advantage in having the shutters fitted at an angle instead of close to the sensitized plate. Further improvements might also be made by subdividing the perpendicular shutters, and fitting them with four milled heads for rotation, and in fact, there appears to be a great range for ingenuity, if required, to produce these photographic curiosities.

Acting upon the principle that if we conquer any little difficulty, as members of a society, we should be bound to save the time of others going over the same ground, by describing it early, causes me to bring this before you. I shall also be glad to hear an explanation as to why a pencil of light, which really must act upon the plate twice the time of either exposure necessary to produce the negative, should, when brought to a minimum, not produce a line.

The pictures have been very hurriedly printed, and I have not had time to produce better. I have, however, brought the negative, which, I think you will agree with me, does not show where the junction takes place.

Roughening the Edges of Glass Plates.—Corundum Files.

"Many littles mak' a muckle," says the Scotch proverb. The sum of successful and comfortable practice in photography comprises a number of little things, on one of which it will be our privilege to make some observations at present, premising that up to this time it does not seem to have been deemed worthy of special consideration.

Each plate of glass as it comes from the glazier's table, or is put into the photographer's hands, possesses eight sharp cutting edges; and the advantages resulting from their removal must be obvious to every manipulator. Cuts on the fingers, with the subsequent smartings and inflammation resulting from contact with exciting or fixing solutions, will point to one class of inconveniences arising from leaving the edges of the plates in their original condition; and the abrasion or tearing up of the cloths employed in cleaning the plates will indicate another. Assuming that the necessity for removing these cutting edges is recognised by all photographers, we shall at once consider how it can be best effected.

The worst way of accomplishing this object is by means of a file. This method is commonly employed; but for the reasons which we will adduce it is far from being the best. If the file be sharp and course, the chips which it causes on the edges of the plate are unsightly, and, from their extension on to the surface of the plate sometimes inconvenient. When used dry, a sharp file will some times cause splints to be made which will encroach on the plate to the extent ot an eighth of an inch. Those who have occasion to file glass, are well aware of this tendency, and prevent its occurrence by keeping the file wet with turpentine when reducing glass by its means. If the file possess fine teeth the liability to the chipping of the edge of the glass is very much diminished;

but the rapidity with which the file deteriorates proves a source of expense. A piece of sandstone removes many of these difficulties; we have recently seen in the Oxford street establishment of Mr. Jabez Hughes,a little contrivance for effecting the smoothening of the rough edges of glass plates, which is the simplest and best that we have yet seen.

The instrument in question is a corundum file, so constructed as to grind both edges of a sheet of glass by one movement of the file. It may be briefly described as a cake of corundum of about two inches long, half-an-inch thick, and three-quarters wide. On the upper side a V-shaped groove extends from end to end, and as both sides of this groove possess those cutting powers so characteristic of corundum, it follows that when the grooved side of the file is applied to and drawn over the edge of a plate of glass, both sides will be ground by the one operation. The cost of a file of this description is, we understand, only a few pence, and its efficiency will be certified by every one who tries it.

Corundum, or emery, is extensively employed in the arts, for polishing, or grinding glass, metals, &c. It is used almost exclusively for cutting the softer class of minerals, for which purpose it has been employed from a very ancient date. We have in our laboratory some corundum wheels and files used by the lapidaries in India; and from their similarity in appearance, together with their possessing the same properties as the files for glass used in this country, we presume that both are produced in a similar way.

The following is the manner in which these corundum files are made :—Take of lac eight parts, melt it thoroughly, and then add one part, by weight, of corundum Stir them well togetether, so as to ensure intimate mixing. The composition may be moulded to any desired form. A greater or less proportion of coruudum may be added according to the requirements of the maker. Artificial emery stones are also made by mixing coarse emery powder with half its weight of pulverized Stourbridge loam and a little water, sufficient to form a thick paste. This is pressed into a metallic mould, and, after having been thoroughly dried, it is baked in a muffle at a temparature between a red heat and a white heat. A stone so prepared will be found to cut very greedily, and to suffer but little from wear.

We anticipate that the low price at which the photographic glass files are sold will render it much cheaper for the operator to purchase these useful little instruments than to make them for himself.—*Brit. Journ.*

A Printing-Frame for Opal Pictures.

BY JAMES G. TUNNY.

The negative is laid down on the printing-frame glass. There is a moveable bar of brass, sheathed with a piece of India-rubber tubing that moves in two slots in the sides of the printing-frame, close to the glass—that is, brought close up to the negative, which keeps it jammed to the side of the printing-frame. The lid, so to speak, of the printing-frame is not hinged in the centre, but is hinged to a piece a little thicker than the piece that folds up and down, carrying the prepared opal glass, which is attached to it by the corners by means of a little piece of gutta-percha or pitch. The piece of wood to which this lid is hinged moves up and down in a groove at each side of the printing-frame, and on the under side of this piece of wood there is a brass spring which keeps it level with the surface of the opal glass. This allows of any thickness of opal glass being used. There is a pinching screw at the back which fixes this piece of wood when pressed down in contact with the prepared glass and negative. The opal glass now forms part of the lid, which can now be lifted up and down at pleasure, to examine the progress of the printing, without the least chance of movement.

You will see that nothing can be simpler than this arrangement. Those who would like to get rid of the attaching of the opal glass to the lid by gutta-percha, could have it made with two bars running in slots sheathed with India-rubber, the same as the under bar for fastening the negative. By this means any size of glass could be used; but in my opinion the attachment by the gutta-percha is the better of the two, for in printing a small oval locket or brooch, you can place it with perfect precision on the head of the figure on the negative, and by simply dripping two small drops of melted gutta-percha on the corners, and pressing down the lid, the contact is made. Now this could not be so readily managed with sliding bars.

I am thinking of sending up one of these printing-frames to some of the London makers, so that the profession may have the advantage of it.—*Brit. Journ.*

Washing Prints.

The subject of washing prints has attracted much attention amongst photographers during the last year or two, and various contrivances have been suggested for the purpose, all proceeding on the principle of not allowing the prints to lie sticking together in stagnant water.

Messrs, Edwards and Son, of the Dalehall Potteries, have just completed the manufacture of a very simple and effective automatic washing trough for prints, which we can strongly recommend as the most serviceable that has yet come under our notice. It consists of a cylindrical vessel about a foot in diameter and seven inches deep, having a false removable bottom, like a fish kettle and two holes in the side, one near the top, the other near the bottom. Through the upper hole is to be inserted a pipe through which water is admitted from the reservoir in such a way as to strike the side of the vessel obliquely, and thereby communicate rotation to the mass of water within it as well as to the floating prints; while the excess of water is permitted to flow off through another pipe inserted in the lower hole. This latter pipe may be made according to the fancy of the operator, but the best plan will be to make it like a syphon with its longer leg extending below the bottom of the vessel, and its bore rather larger than that of the upper pipe, the effect of which will be that the vessel will empty itself alternately, and the prints be kept in constant motion. The whole being made of nice clean glazed pottery, with a perforated and removable false bottom, upon which the prints lie when the vessel is empty, and by means of which they can be removed *en masse*; there seems to be nothing more to desire, and we sincerely hope that every one of our readers, whether professional or amateur, will supply himself with one of these excellent, inexpensive, and simple washing troughs.

We must be permitted to remind our readers that the principle of the above trough was suggested by ourselves as long ago as 1858. That suggestion has turned out to be one of many which we have at different times thrown out, and which after the lapse years has been adopted. The idea of the syphon for emptying the vessel, which is a very ingenious one, is due, we believe, to Messrs. Bull, of Long Acre. (See page 501, Am. Journ.)

In addition to the washing trough above described, we have received from Messrs. Edwards and Son a few more novelties in vitreous and iron-stone ware, for the use of photographers. Of these the principal ones are a dish, one-third of which is covered so as to form a flat shelf upon which to lay the prints whilst being examined in conrse of toning and fixing; and a dish so contrived as to allow all the fluid to be tilted to one end without overflowing, while the prints are left high and dry at the otheer end.

In fact, all the novelties which Messrs. Edwards and Son have lately brought out for photngraphic purposes are extremely charming, and we hope our readers will not fail to take our hints and procure these useful articles, which merit the highest praise, not only for ingenuity of design, but for excellence of material and workmanship.—*Photo. Notes.*

The Wet Collodion Process without the Nitrate Bath.

BY NELSON K. CHERRILL.

I have just commenced a series of experiments, in order to arrive, if possible, at a certain and rapid method of working with wet collodion plates without the use of the nitrate bath.

I am nearly certain that, after a sufficient investigation, a process may be brought to perfection which will accomplish this most desirable end, to the great comfort of the tourist and landscape photographer.

I think your process of working on paper with *collodio-chloride of silver* contains the germ, if I may so call it, of the process which I am desirous of bringing into notice.

I beg to hand you the first result I have obtained by embodying tne following crude idea in a simple experiment.

The surface requisite for the formation of a photographic image by the wet collodion process is one composed of *collodio-iodide and bromide of silver with* FREE *nitrote of silver in excess.* This collodio-iodide and bromide of silver with the excess of nitrate might be formed in a bottle, in the same way as you would form collodio-chloride for printing pueposes; in fact, by adding *nitrate of silver* to any *bromo-iodzed collodion that gives good results by the osdinary wet process.* The collodion thus sensitized might be poured on a plate, exposed, developed (in a dish) and then intensified by any ordinary method. Such was the crude idea.

To work it into simple practice, I took two ounces of Mawson's bromo-iodized negative collodion, and added twenty grains of nitrate of silver in about half a drachm of alcohol in the way now so well known. I left it for about half an hour to settle, and then tried a plate or two, *giving the same exposure as if for the ordinary wet process with the same collodion ;* fordevelopment, the plates were shot into a dish containing an old iron developer made with the ammonia-sulphate with a full dose of acetic acid. The image came out but slowly, having very much the appearance of a tannin negative under the influence of an alkaline developer. The plate was removed in about ten minutes, washed, fixed, and then redeveloped with iodine and pyro in the old style.

The samples were taken with the full aperture of Dallmeyer's triplet, No. 1, on a very dull day.

The plates will only keep for two minutes, owing to the evaporation of the ether.

I hope to make more experiments, as I said before, and if you would like to see the results I shall be happy to forward them to you.

[Our correspondent has been working in a direction often attempted, but never with sufficient success to demand much attention until Messrs. Sayce and Bolton devised a capital dry process last year. The examples forwarded now by our correspondent are, however, very good; by far the most perfect we have seen produced without a nitrate bath, by what may be termed the wet process. The great point is to establish the exact conditions of success. If our correspondent can produce such pictures as he has sent us, at will, he has accomplished a great and important fact. We hope he will continue his experiments, and let us hear further from him.—Ed. *Photo. News.*

Automatic Washing Box.

Now after having allowed at least half a dozen to re-invent this box, I for the first time step forward to claim my child, named as above.

I am led to this paternal action by the remarks of Mr. Sutton in his *Photographic Notes* of April 1, 1865, in which he says, "Messrs. Bull of Long Acre" are the inventors of the syphon attachment. If he had written Mr. Hull of New York, he would have hit the nail on the head, and so he would had he known.

In 1863 Messrs. Bull of Long Acre put forth a circular on "self acting washing apparatus," the principal feature of which was the syphon attachment, stating that they were "sole inventors," &c.; for it they received very flattering notices from the *British Journal of Photography*, and from the *Phootographic News.* Now the funny part consists of these facts :

In the American Journal of Photography for August 1, 1860, was published a communication signed H., with an engraving, showing the action of my washing box. It was copied into the *British Journal*, Oct. 15, illustrated with a sketch, and was also published by the *Notes*, and *News ;* however of the last two I am not certain.

As this syphon washing apparatus is now all but universal, having been made up in porcelain ware and regularly sold for a long while, and being a thorough and easy method of washing not only prints, but anything requiring a constant change of water, I have thought it best to step from behind the unknown signature of H, and sign one not quite unknown to your readers, to wit— Chas. Wager Hull.

Photography in Germany.

We find the following interesting items in a recent number of the *Photographic News :*

Washing Prints.—Dr. Reissig's method of washing prints is now published in a small "brochure" which is very attractive. The method is founded on the application of centrifugal power. The prints, after fixing and washing, are put for some minutes into a wooden centrifugal machine, then removed from it, washed, and treated again in the engine, and this operation is repeated four times. The prints are washed completely in this manner in one hour.

Test for Hypo.—Dr. Reissig has also found a new method for discovering the least trace of hyposulphite in the wash water. Take a single galvanic element, of Bunsen or Grove, with silver plates on the anode and cathode, dip the two last into the water to be tested, and you will see, if any trace of hypo is present, a yellow or brownish appearance on the cathode. The proof is very fine, but the employment of galvanic batteries is disagreeable.

Another very simple method for discovering a trace of hypo is published by Mr. Grüne, of our Photographic Society. Mr. Grüne treats any finished negative with perchloride of mercury, and puts a piece of the film, colored white in this manner, in the water to be tested. If hypo is present in the least trace, the film will soon be grey or black when the proof is warmed. The white film can be removed from the plate, and will keep a long time for use in a glass with water.

Green or Yellow Negätives.—A good method for coloring negatives green or yellow, instead of intensifying in the ordinary way, has been published by Mr. Böhm. Pour into a concentrated solution of perchloride of mercury a solution of iodide of potassium till the precipitate produced at first is redissolved. This solution (already long known in photography) is poured over the fixed and washed negative. The negative will become at first black, then black-green, green, and finally yellow. The best color is the green, it gives very fine prints. At last the negative is washed and varnished. Do you know the reason of the green color in this case? It is the protoiodide of silver, Ag_2I. I have now produced this very interesting substance as a green powder, and will describe it in my next letter.

[This process was first published several years since in this Journal, by Mr. E. K. Hough.]—Ed. Am. Journ.

Photographic Societies.

BY CHAS. WAGER HULL.

Mr. Editor—Contrary to my usual habit in writing for photographic journals, I propose this time to do up a little growling, and to ask not of you but of photographers in general, a few plain questions, which I propose each shall answer to himself, and of photographers in this city particularly I claim attention.

Why is it that societies in which *"their all"* forms the only subject of consideration never receive from the profession that support which is not only to the interest of the society, but vastly more to their own? Do they fancy that they have arrived at that much desired state of perfection, that they have nothing more to learn? consequently, it would be but time lost to attend meetings of societies. If this is their reason, it is a poor one, and proves an amount of conceit which should not be acknowledged in public.

I venture the assertion that not one man lives within the limits of this city, engaged in photography, who would not be benefitted by attending the meetings of the Photographical Society; some suggestion exactly meeting his troubles would be made; or some change in his method of manipulation proposed, which would more than repay the loss of an evening (if loss it be), and fully repay the trifling expense, which even in these war times, amounts to but a half dozen cartes de visite per annum.

Do they fancy that they have some trick in the collodion, bath, developer, or something else, which they don't want to tell? If such is the reason, then let them rest easy—for they are not bound to tell, if they do not introduce the subject. To be more explicit. If A has a secret in the preparation of his collodion, then A would not be at liberty to rise and ask B, how he makes his, unless he is willing to reciprocate.

It is not speaking at random to assert that no one formula for chemicals will work well in all places, a collodion which gives details and sufficient intensity under A's skylight, will work flat, or with too great contrasts under B's; thus we may assert with truth, that in photography as well as in the every day walks of life, that "what is one man's meat is another man's poison," and by this fact prove that men need not be so afraid of what they do.

It is with photographers as with all others of the human family that those who *know the most* are ever most willing that others should profit by their experience and learning, are never selfish and close-mouthed, while those who know but little are the reverse and prove the old saying, that "a little learning is a dangerous thing."

If it is that the profession think that the work they do is good enough, then good-bye to all efforts to improve the art. That the work is not good as a rule, but bad as a fact, can be proven any time in an hour, by a stroll along the streets and an inspection of the *samples* in front of the doors; most of them are a disgrace to the profession in their chemical effect as well as in an artistic point of view.

I long since came to the conclusion that no man's success alone depended upon any given formula, but rather on his ability to suit his chemicals to his light, to develop and carry out the whole details of his art with judgment and care, suiting each operation to the others, that all may when finished produce a harmonious whole, artistic, and as near perfect as our yet unfinished science will permit.

What sort of pre-eminence could a man attain in photography providing he was a mute and could not hear, having only his eyes to aid him in his profession? will any one assert that he would progress as rapidly as the man who possessed all his senses? This illustration must prove to any one how important it is to compare ideas, and how essential to the rapid advancement of the art, is the constant interchange of thought and experience.

If these arguments be true, then where can photographers reap more benefit than at the meetings of societies founded for photographic study alone?

These remarks apply not alone to *our* city and *our* society, but to *all others*, the faults here found are found everywhere.

It will be thought perhaps by some that my remarks are too severe; if so, I beg pardon, and plead as an excuse, that I am an amateur who for many years have followed photography with unceasing devotion, ever willing to learn from the many who know more, and ever willing to teach the few who know less.

Do not understand, Mr. Editor, that the object of this is to beg photographers to join societies, for the society's sake, but to beg them to join for their own sake.

NEW YORK, April 14, 1865.

Editorial Department.

———The office of this Journal is removed to No. 246 Canal street, next door to the former office.

———In describing the use of a velvet screen in producing double pictures, some of the writers have spoken of the screen as a curtain, giving the impression that it should be a large curtain as far off from the camera as the sitter, while in fact, it need be for a quarter lens only about a foot square. Lately it seems to be the fashion to have it suspended from a stick which is attached to the top of the camera box. One end of the stick is fastened by a pivot to the box, and the sweep of the stick is limited exactly by two projecting pins set at the proper distance apart. The device is simple and ingenious.

———Mr. Hull, on page 501, makes statements which will seem surprising to many of our readers who are accustomed to believe in the old rubbish about British fair play. We know the facts in this case, and we do assert that Mr. Hull has told the story of the injustice done him, very mildly.

But we constantly read the British journals, and such cases as this have become so common that they have long since ceased to excite so strong an emotion as indignation. The impudence of one of the latest cases of the ignoring of palpable facts is laughable: The *News* copied from this Journal Mr. Lea's article on Schlippe's salt, and gave proper credit to us The *British Journal* thereupon charges us with having appropriated the article from its columns, and the *News* with having used it while knowing that it was stolen property! The article which we published has never appeared in the *British Journal!*

———By reason of the death of the President, and the collapse of the rebellion, ordinary business has been much interrupted during the past few weeks. Gentlemen in the country who have found their orders to city merchants delayed, will please bear the fact in mind, and growl as gently as possible. In addition to the general interruption, we have had in our own case the care of the removal of our business. We have found it impossible to attend to correspondents as promptly as usual.

Several valuable communications are laid over.

Minor Correspondence.

B. F. G., of N. Y.—"I am fitting up a photographic gallery with a skylight about twelve feet square, facing the east, connected with a side light eight fee high, by ten in width. Should I use clear glass, or ground glass?" ....W say, use clear glass. Then with a muslin curtain or screen, you are prepared for all kinds of weather. Those whb have ground glass, on cloudy days realize that it is not quite the thing.

A. N. L., of Ind.—1. "Shall I use a camera or a printing-frame for porcelain pictures? 2. Is the printing-frame patented?" ....1. If you have only the ordinary uneven opal glass, nothing is practicable but the camera process. If you have the flat glass, the direct contact printing is to be preferred.

A. G., of Mass.—There is no collodion on sale, especially prepared for opalotypes, so far as we know; nor is there any peculiar formula for such collodion. We have not heard of any "secret" in the making of the pictures, and do not believe there is any.

D. H. L., of Ill.—"In precipitating silver with muriatic acid, will an excess of acid keep silver in solution? Can the acid water drawn off after precipitating, be used again for the same purpose, and will it answer as well as adding fresh acid? 2. Is the thick black offensive sediment in the bottom of the sink worth saving?" ....1. An excess of acid dissolves only an insignificant amount of silver. The acid water on the precipitate should be thrown away. If it by chance contains any muriatic acid, it would be too much diluted for practical use. 2. It probably contains silver.

G. G., of O.—"Is there any method of restoring old or red collodion to good working condition; if there is, will you please inform me what it is? 2. Have you ever used the chloro-platinate of mercury for intensifying, and is it better than the solutions ordinarily used for that purpose? I see it advertised in your Journal as something very superior." ....1. The red color may be removed, by shaking up the red collodion with zinc, cadmium, or silver; but in this case it is doubtful if the working qualities of the collodion are improved. Old collodion may generally be mixed with new to the advantage of both. 2. We have not used the chloro-platinate, but we have a good opinion of it.

S. T. T., of Mich.—"Can you send chloride of gold safely by mail? 2. What is the best work published on photography for a young beginner? 3. What is the cause of prints turning red and bleaching out when they are put into the hypo solution, when they come out of the gold good blacks? 4. Is there any way of knowing what kind of albumen paper will print black, without trying it?" ....1. Yes. 2. Our favorite book is Divine's Manipulation. We recommend it to all. 3. The turning red in hypo may be due to insufficient, or too rapid toning, or to a peculiar quality of paper. 4. We know of none.

F. H. A., of Md.—"The Journal is much better than I expected to find it, and consider that the information given in the seven numbers I now have to be well worth several times the amount of subscription charged."

G., of Wis.—"I distill my water in a tin still. The worm is a lead pipe. I use rain, ice, or river water. Nitrate of silver gives it a little of a milky hue; yet negatives are clear and free from fog. Would you advise me to construct a different still and worm? If so, of what material should the still and worm be composed? 2. Of all the catalogue of intensifying agents, which do you consider the most practical for card work? Please give it in your next; also the method of manipulating with it." ....1. The still should be of copper and the condenser of block tin. A one gallon still and worm of the best sort would cost about twelve dollars. 2. We should require half a dozen pages to answer you fully. When but little strengthening is desired, sulphuret of potassium may be used; where the greatest is wanted as in copies of engravings or writings, we advise Schlippe's salt. But the intelligent photographer will not limit himself to these.

M. B., of Me.—"I received a communication from Smyth and Hubbell, of Boston informing me I had a license of fifty dollars to pay, for infringement of Cutting's patent. The agent has not called yet, but was to do so in ten days; how much can they claim?" ....We supposed the Cutting patents were quite "played out." We do not think it advisable for photographers to pay anything to these patent agents, at least unless compulsion is resorted to.

THE AMERICAN

Journal of Photography.

[NEW SERIES.]

VOL VII. MAY 15, 1865. NO. 22

The New Method of Intensifying.

Some further experience with Mr. Carey Lea's new method of intensifying by producing a non-actinic color in negatives, confirms our first conjectures as to its probable utility; but also suggests the importance of caution in using a new power until the bounds of its capabilities are well understood and defined. We find that by the use of the new agent proposed a great variety of effects may be secured, and that it is equally possible to obtain just the best possible amount of printing intensity in a negative, or to spoil it altogether.

We have used, in our experiments, the double sulphide proposed in one or two different forms, with equal success. As we before stated, Schlippe's salt is not usually to be met with in commerce, and we proceeded to prepare it for ourselves, and we asked Messrs. Hopkins and Williams to prepare us a sample also, with a view to testing an article which will probably be prepared commercially if a demand for it arise. These gentlemen kindly prepared us the salt from Mr. Carey Lea's formula. It consists of yellow tetrahedral crystals, which very readily decompose and become covered with an orange-colored or brown powder. About twenty grains, in an ounce of water, are sufficient to produce the coloration in the negative. The major part of our experiments were, however, conducted with the sulphantimoniate we prepared ourselves. Although the instructions given by Mr. Lea are clear and simple, it may be interesting to state briefly our own mode of preparing the solution. We took—

Grey sulphide of antimony	1 ounce.
Common carbonate of soda	2 ounces.
Freshly burnt lime	5½ drachms.
Flowers of sulphur	1¼ "
Water	8 ounces.

A portion of the water was added to the lime, and the whole then placed in a pint bottle and well shaken. This was then placed near the fire, where a temperature of about 140° was maintained, and the bottle shaken from time to time. At the end of about six hours all appearance of the grey sulphide of antimony was gone, a bulky white insoluble powder remained at the bottom, chiefly consisting of carbonate of lime and antimoniate of soda, and the clear, yellow, supernatant liquid was removed by filtration. This consisted of a concentrated solution of the double sulphide of antimony and sodium, or sulphantimoniate of soda, which would, on evaporation, have yielded crystals of Schlippe's salt. We did not, however, attempt to crystallize it, our object being to try the action of the solution thus obtained, and thus save one operation. It answered the purpose admirably, one drachm of the solution in from one to two ounces of water being quite strong enough for the purpose intended, and giving with proper preliminary treatment any color, from brown to scarlet.

We next proceeded to carry out Mr. Lea's instructions as to the preliminary treatment of the plate, the chief object of which appears to be to render the deposit of silver permeable and readily accessible to chemical action. A number of old plates, positives and negatives, were subjected to treatment, some of which were first treated with bichloride of mercury, some with iodide of mercury, and some with a solution of tincture of iodine, followed by the sulphantimoniate solution in different degrees of concentration. Plates treated with bichloride of mercury until they were quite white, and then submitted to the action of a strong solution of the sulphantimoniate, at once became deep black, and very dense, without any trace of redness. Treated with a dilute solution of the new salt they assumed a delicate salmon color, and with a solution a little stronger the color produced was red. Plates treated with bichloride of mercury, followed by a dilute solution of iodide of potassium, at once assumed a deep non-actinic orange or red tint. Plates treated with a dilute tincture of iodine or a solution of iodide of potassium in water, until they were of a greenish grey color, and then submitted to a dilute solution of the sulphantimoniate, assumed a russet brown tint, both by reflected and transmitted light which is very non-actinic and effective in printing. If the action of the iodine were continued until the negative were of a pale lemon color, then it became orange on treatment with the silver salt; and if the action of the iodine was carried on until the negative became bright yellow, a bright transparent scarlet was produced by the Schlippe's salt.

With the preliminary mercury treatment, the negatives, no matter what color was produced, always retained a certain amount of opacity; with the iodine the effect was somewhat different. With the iodine applied for a short time only, a slight increase of opacity was observed; but as photographers know, if the action of iodine be continued, that opacity disappears in proportion as the colors tend towards yellow, until finally the densest parts of the negative will appear transparent, but of a very bright yellow in color. When this stage is attained, the transparency remains after the application of the sulphantimoniate, and the densest parts of the image appear to be formed of bright orange or scarlet glass. If, however, the iodine treatment be continued only until the negative be of an olive grey, and the color after final treatment to a russet brown, it is then quite opaque in the densest parts, and the coloring matter is quite superficial, not showing at all at the back of the plate, whilst in the former case it appears to permeate the entire film, and both sides of the negative appear red.

There is one danger in using the process, by no means a necessary one, but which might very easily be encountered if it were not pointed out; it is this: when the treatment with iodine is continued until the full yellow color is obtained necessary in producing a bright scarlet, the operator may be surprised to see his film after it has assumed a beautiful scarlet, suddenly appear, as if abraded in various places, with mottled or granular effect of surface. On again letting the water fall on it from the tap to remove the granular looking deposit where it is abraded, it becomes worse, and on touching the film with his finger, he finds the whole of the red deposit, and the image as well may be rubbed away, consisting of a loosely adherent or powdery film. Or it may leave his hands looking all right, but on drying, it assumes the same abraded appearance; the surface cracking in drying much in the same manner as when a plate is unwashed, and a solution crystallized on its surface. The first impression is, that the film has been rotted from the action of the solutions to which it has been submitted; but on examination, it will be found that a thin film of collodion, quite clean, with only a phantom trace of image, remains intact on the glass; but the chief portion of the image having been converted into a loosely coherent powdery layer is easily broken by a stream of water, and under some circumstances, cracks in drying. The remedy is very plain; it is simply to avoid carrying the iodizing process so far, as a better result is obtained without incurring any danger, by stopping the action at an earlier stage.

The best effect, in our experience, is produced by submitting the negative to a solution of iodine one grain, and iodide of potassium two grains in an ounce of water. The action of this is not rapid, and is, therefore, under control. This succeeded, after washing with a dilute solution of sulphantimoniate, giving an even russet brown color very effectually nonactinic. Stronger solutions of iodine act more rapidly, but are less under control, and more apt to cause stains. If solutions of the salts to be employed are kept in dishes, or dipping baths with covers, a more even action is secured, as there is always some difficulty in covering the plate by pouring sufficiently quickly to prevent irregular action and stains. Care should be used to use the double sulphide in a well-ventilated place, as sulphuretted hydrogen is given off in the decomposition induced on applying it to a plate.

Unlike the deposit produced by some similar modes of intensifying, this is not injured by varnishing. It has been a frequent source of disappointment to the photographer who has intensified a negative by salts of mercury, to see his dense image become perfectly transparent on applying the varnish. Those intensified by the new method, have, in our hands, retained their density perfectly after varnishing. The intensification has, moreover, been regular and even, increasing the force of half tones, as well as the high lights, and giving harmonious prints. The range of power it will give remains to be proved by further experience; which, also, alone can determine its permanency and freedom from change under the action of light.

The dilute solution is easily decomposed, as, indeed, is a strong solution also on contact with any acid, the decomposition being accompanied with evolution of sulphuretted hydrogen and a deposit of a beautiful yellow color, known, in old terminology as the golden sulphuret of antimony, or sulphur auratum. The fingers are stained of a yellow brown by contact with the solution; this can be removed by a careful application of a caustic alkali. Both crystals and solutions should be kept in well corked or stoppered bottles.—*Photo. News.*

Application of Photography to Oil Painting upon Canvas.

BY M. DE RUMINI.

The object of M. de Rumini's invention is the reproduction by means of photography, upon canvas prepared for oil painting, *primed canvas*, of portraits, landscapes, monuments, still life, and with increase or diminution in size of the object represented, and of which the special aim is to enable oil painters to avoid drawing the subject by hand upon the canvas.

Preparation for Carbon Printing.—Cover the canvas with a liquid composed of—

Bichromate of potass................	15	parts.
Gelatine.............................	20	"
Distilled water......................	100	"

The mixture of these ingredients is made warm in a *bain warie;* it is applied while warm to the surface of the canvas, and spread evenly with a glass rod, and then left to dry.

Preparation of Albumenized Collodion Canvas.—The canvas is first covered with a coating of photographic collodion in the same manner as glass plates are covered. When the alcohol and ether contained in the collodion are partly evaporated, the coating of collodion is covered with a film of bromo-iodized albumen, prepared as follows :—

Albumen	100 parts.
Water	100 "
Iodide of potassium	2 "
Bromide of potassium	1 part.

The only object of employing the collodion is to cause the albumen to spread evenly upon the canvas. Its state of humidity permits this result.

The collodion being dry, there would be the same difficulty in spreading the albumen upon it as there would be upon the oily surface of the canvas.

The coating of albumen being completely dry, it is sensitized and coagulated with a solution, applied by means of a tuft of cotton, composed of—

Distilled water	100 parts.
Nitrate of silver	10 "
Acetic acid	100 "

The albumen is next submitted to a washing with water, to remove the excess of nitrate. The canvas, when completely dry, is exposed behind the solar microscope to the action of the negative to be copied, until the picture appears faintly upon it. The latter is developed by means of a saturated solution of gallic acid, the action of which is stopped by means of a washing with water. The picture is then fixed with a saturated solution of hyposulphite of soda. The operation is concluded by washing with water.—*Le Genie Industriel.*

The Mission of Photography.

BY CALVIN THURBER.

It needs no prophetic power to foresee the noble mission that photography has yet to unfold to man. What the art of printing has been and now is to literature, photography will some day be to art. And there is a delicate analogy that may be traced out in the mission of these two arts. Both came to reveal to man a new world, and are most emphatically the arts of the people, and the educator of the masses. Before the advent of the art of printing the masses were sunk in the lowest ignorance. To them the world of thought, of intellect, and of truth was a circle so exceeding narrow that it was almost a living grave. The art came, and under the fostering sunlight of a purer thought the mind grew up until its vision was above that narrow circle, and it looked out upon infinity. Compare the fourteenth with the nineteenth century, and say how much man owes to that art for his present elevation; and yet there were, no doubt, minds *then* that could not see how the art could ever be the means of raising man to his present position, and, no doubt, there are minds *to-day* which can see no future good to come from the cultivation of art. But this is no place to attempt to prove the value and necessity of the understanding of art in the education of man. This is a point which must be taken for granted. We know that man has not learned all. What he has learned is but a single atom to the mountain of the unlearned; and there is a world which to the masses of mankind is to-day sealed in impenetrable mystery, though revelations from it are scattered around him so plentifully that he cannot open his eyes and not see them. The world of beauty and art is the peculiar language by which the truths of that world are expressed. But hitherto the expression and influence of all high and true art has been circumscribed by the narrow circle of the rich and great, but that can be so no longer, for photography, with the wand of a sunbeam, hath swept away all of these patrician bounds and has said, "Let there be light." No longer can the favored few monopolize the elevating and ennobling influences ever exerted by true art; as well might they attempt to buy and sell God's free sunshine, for through the instrumentality of photography is to spring up a love and knowledge of art that will find its way to the homes of all, even the humblest in the land. To the poor cottager, whose means would scarcely allow of his travelling beyond the limits of his own State, it comes as the fruitful story-teller from the remotest corners of the earth, and by his own humble fireside he can study the glorious, the sublime and the beautiful in art and in nature, and his mind catches a spirit of refinement from communion with these things of beauty, that will almost insensibly steal in and influence his every-day life. Like every great step, photography will lead to great results: results of a different character, it is true, from those produced by the invention of the steam engine, but still none the less necessary to man's advancement, though they may be underrated, for the resulting influences of art are ever quiet and unobtrusive in their action, coming to fulfill their mission only after man has learned the sterner and more practical lessons of life. Man has learned these harsher lessons, and to-day his mind is ready to receive the softening and polishing touches of art, and sun-painting comes to teach him its alphabet and its first simple principles gradually correcting the taste, arousing the judgment, chastening the imagination, and pointing the mind to that which is above itself.

Such is the mission of our art-science to the masses. It comes to scatter with lavish hand the elevating influences of a true art around their humble hearth stones, acting as interpreter to them of all that is beautiful in art and nature. But it has a lesson too for the cultivated and refined. Even he who has spent a life of devotion in the study of the profound principles of high art, may sit beneath her teachings and learn some useful lesson. Photography comes to elevate and purify all art, and to exalt the standard of artistic merit. Her advent is infusing into the world of art an element of truth such as never existed there before. She is to be not only the teacher of the masses but also the teacher of the disciple of art. He can no longer be a mere copyist, for the camera can do that work far better than he can ever hope to, and he is thus driven to take a step higher into the field of cultivated imagination and to idealize the truth which photography gives him, and by so doing a new and vital impulse is given to his profession. Such being the dignity of our noble art, let its followers never lose sight of the fact that he who stands beside the camera has no less need of artistic instincts and feelings than he who stands before the easel, and if a true man and a true artist, he who paints with a sunbeam will exert no less an influence than he who holds the brush.

The one works with crude material and simple art, subject to all the imperfections which must ever steal into the productions of the pencil, the other works with an art married to a science as exact as the laws of mathematics, producing pictures beside whose severe truth the work of the most exacting pre-Raphaelite would sink down to a mere daub.

Then let every follower and disciple of our art be conscious of the dignity and responsibility which his vocation imposes upon him, and let him be true to them both, as becomes a man and an artist.

WARREN, R. I., April, 1865.

Woodbury's New Printing Process.

I BEG to submit to your notice an entirely new method of photographic press printing, which, although in the specimens sent is not so perfect as might be wished, still promises the greatest success. You will see that it is entirely different from any press photographs that have hitherto appeared, in the fact of its appearance being exactly the same as an ordinary silver print, and not possessing any grain or stipple. This, I think, is likely to prove a more simple and efficient method than any hitherto brought before the public. I will, therefore, give you a brief outline of the method of proceeding by which the accompanying pictures have been produced.

A copper mould is obtained by exposing a sheet of bichromated gelatine behind a negative, and exposing to parallel rays of light; then washing away the undissolved portions and taking an electrotype cast in copper. This mould is then backed with gutta-percha and placed in a suitable press, having a sheet of white glass, with strong springs, let into the back. Having greased the mould, a transparent mixture of gelatine, water, and suitable color is warmed, and a small quantity poured on the center of the mould. A sheet of paper is then laid on it, and the lid of the press bolted down. This, by exercising a steady pressure, squeezes all the superfluous color out at the side; and on opening the press, the picture is taken off the mould, and in that state is in relief, which, however, dries down to be very slightly so.

The operation is remarkably quick. By having three presses, and, after setting one, then going on with the others, the picture in the first will have set; and by continuing this, as many as two hundred may be easily turned out in an hour. The expense also is very trifling, as all the extra gelatine and color squeezed out may be used over again. The principal things necessary to success are—the most exact surface of the mould, which, if bent in the slightest degree, would produce an uneven picture; also, the addition of the color in the exact proportion to produce the necessary depth in the picture.

I hope to be able to send you better specimens and complete details of the process in a few days. It is a curious fact that having, in the earlier stage of my experiments, shown a rough specimen by this process to a friend of Mr. Swan's, he acquainted me with the fact that that gentleman had also had a similar idea to myself; but, as he learned that I had patented the process, he did not proceed with it. Still, as the idea of the thing occurred to him, independently of any information from me, credit is equally due to that gentleman. WALTER WOODBURY.

[We look forward with much interest to the working details of Mr. Woodbury's extremely promising process. The specimens he has forwarded to us cannot be distinguished from ordinary silver or carbon prints taken direct from the negative, except by a slight indistinctness of outline, which may, however, not be a defect inseparable from the process. There is no perceptible grain whatever, and the deposit seems to be as fine as reduced silver.—EDS. *British Journal.*]

A Simple Method of Preparing Prints Intended to be Colored with Aniline Colors.

IN the hands of any one unskilled in the art of coloring with aniline colors, the prints are often spoilt through the strong absorption of the colors. On this account it was recommended to coat the print with glycerine.

I have recently employed with success a process which answers the purpose better still. The *carte*, having been previously glazed, is coated with a mixture of nearly equal parts of water and plain albumen, by means of an ordinary camel's-hair brush. In order to get them thoroughly mixed, these substances may be well shaken in a bottle. When the print is dry, the colors can be applied with really remarkable ease and delicacy—better than on any other preparation. The aniline colors may be partly washed off, if necessary. In this way I have obtained pictures as good as can be desired, with great ease and rapidity. The coating subsequently applied also assumes a much more uniform brilliancy. The purity of the colors is also increased by the albumen preparation. JOHANNES GRASSHOF.

—*Photo. Mittheilungen.*

Instructions for Working Burgess's Eburneum Process.

J. M. BURGESS.

DEAR SIR,—I take it for granted, that in setting about this process you will not expect to avoid all failure and difficulty, even though you follow as closely as possible my instructions; but determine to persevere with it until perfect success crown your efforts. I have devoted some months of constant experiment to simplifying the whole process as much as possible, and will now lay before you the result of my labors.

The first part of the process is simply that of taking a transparent positive on collodion, either in the camera or by direct contact with the negative on a dry plate. I prefer the former method, for several reasons. This transparency is toned, either with gold, or bichloride of mercury followed with hydrosulphate of ammonia—the former giving a black tone, the latter a brown tone. When dry, the plate is coated with a mixture of gelatine, glycerine, and oxide of zinc, and when this is dry (which will take about thirty-six hours if kept at a temperature of 60° Fah.), it is again coated with *plain* colodion. In about two hours you may run a penknife round the edges, and strip the whole off the glass. After trimming, you have the picture complete.

The following are required for the process, and it will be well to get them all in readiness before commencing work :—

1. Patent plate glass.

2. Saturated solution of best white bees'-wax in methylated ether.

. Solution of India rubber in benzole

India rubber	6-grs.
Benzole	1-oz.

4. A good negative collodion, one giving a tough, horny film, is best.

5. Nitrate bath in good working order for negatives

6. *Developing Solutions:* the iron should be used if the negative is tolerably vigorous, the pyro if the negative is weak and the light strong.

Protosulphate of iron	5 grs.
Citric acid	5 grs.
Glacial acetic acid	10 mins.
Water	1 oz

Pyrogallic acid	3 to 6 grs.
Citric acid	3 grs.
Glacial acetic acid	20 mins.
Water	1 oz.

7. *Fixing Solution:*

Cyanide of potassium	½ oz.
Water	1 pint.

8. *Toning Bath:*

Chloride of gold	1 gr.
Water	6 ozs.

9. *Opaline Gelatine:*

French clear gelatine	5 ozs.
Water	20 ozs.
Glycerine	½ oz.
Oxide of zinc	1 oz.

10. Mawsons' enamelling collodion, 4s. per pint.
11. Pure glycerine.
12. Copying camera.
13. Spirit-level.
14. Two or three levelling stands.
15. Drying box.
16. Bichloride of mercury.
17. Hydrosulphate of ammonia.

Now we will set to work. First, let us prepare the opaline gelatine, as we shall want to have that ready for use when we have obtained the picture. Soak the gelatine in the water for a few hours, then dissolve by gentle heat, and filter through flannel. Put the zinc white into a glass mortar, add to it the glycerine and

1-oz of water ; when thoroughly mixed, stir it into the warm gelatine, and let it stand aside for two hours, in order that the coarser particles may settle to the bottom. It is better then to decant it carefully into a clean bottle, and it will be quite ready for use.

Having previously cleaned our stock of glasses, we pour on one of them a little of the bees'-wax solution, and spread it quickly over the entire surface of the glass with a tuft of clean cotton wool. In a few seconds the ether will have evaporated. We then polish the plate with a piece of clean linen kept for the purpose, which will leave a very thin and scarcely perceptible coating of wax on the glass.* This is done as quickly as it is described, and it may be well to prepare all the glasses before proceeding. They may be kept for a week or two in a plate-box in this state, without further cleaning.

The next step is to pass a camel-hair brush, dipped in the India-rubber solution, round the edges of the glass, about $\frac{1}{8}$-in. in width, and coat with negative collodion, then immerse in nitrate bath. Whilst the plate is in the bath, we will focus the negative on the ground glass of a copying camera,† just as if we were going to take a transparent positive. We have now exposed the plate, and proceed to develop it. Of course the exposure will vary with circumstances—such as amount of light, size of stop, and character of negative—and can only be ascertained by experiment. The right exposure is given when the half-tones show before a great deal of depth is obtained in the shadows. A few experiments will teach this better than I can describe it; and this is the only real difficulty in the process. The development is, of course, conducted just as for a negative. It is very easy to see when to stop the development. We fix the plate in cyanide of potassium, and having washed well under a tap, place it in the toning bath ; here it remains until the picture is toned completely through to the glass‡. When it is intended to tone with mercury and hrdrosulphate the exposure must be longer and the development shorter, so as to obtain a very weak positive ; because in this case the toning will increase the depth of the shadows. A good washing for a quarter of an hour under the tap completes the picture so far, and we stand it on one side (free from dust) to dry. It should not be dried by heat. Now varnish the plate with spirit varnish.

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*You need not fear rubbing off all the wax, as it is almost impossible to do that if you let the ether evaporate before commencing to polish.

† I use a camera constructed for the purpose, with repeating back, to take four cartes on a whole plate.

‡ If a brown one is desired, instead of toning with gold, flow over the plate a saturated solution of bichloride of mercury, let it remain until the image is white quite through ; wash well, and apply a weak solution of hydrosulphate of ammonia water 1-oz. Hydro, ammon, 6-drops. The tone will vary with the quantity ammonia employed.

The next step will be to paste strips of paper around the edges of the glass at the back, turning up the edges for about one-eighth of an inch, so that when the plate is laid down, collodion side up, a dish will be formed, in which pour the gelatine mixture, prepared as above.* The plate should rest on a levelling stand, made perfectly horizontal with a spirit-level. As soon as the gelatine is well set, the plate may be placed in the drying box. An old box or barrel of any description will answer for a drying box. It should be well washed, the bottom perforated, and a cover of perforated zinc provided. It may be heated by an ordinary paraffine lamp, or by gas, the plates resting on nails driven into the sides. The temperature may be between 60° and 70° Fah. In thirty-six hours the gelatine will have thoroughly dried. It is then coated with the plain collodion, or with varnish, and left for about two hours if the former be used. Now run a penknife round the edges, and the whole will readily leave the glass, having a perfectly polished surface. It only remains to trim the edges, and the Eburneum portrait is complete.

A LIST OF FAILURES, WITH THEIR CAUSES AND REMEDIES.

1. *The whites of the picture are not pure, although the gelatine mixture is as white as may be desired.*—The evident cause is fog, arising either from the bath being out of order, or over-exposure. A slight amount of fog may be removed by flowing over the plate a solution of iodide of potassium.

Tincture of iodine……………………	6 drops.
Iodide of potassium…………………	2 grs.
Water………………………………	1 oz.

Allow this to remain on the plate for a few minutes, wash well, and follow with a weak solution of cyanide of potassium. Take a drachm of the fixing bath to 4-oz. of water.

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* Three ounces of gelatine mixture to a whole plate. The paper is not required for a small plate.

2. *The picture is hard, although the negative is soft.*—Under-exposure and over-development is the cause.

3. *The surface is not good on leaving the glass.*—Too much wax has been left on the plate.

4. *The picture leaves the glass in places, mostly in the centre, spoiling the surface.*—The gelatine was too hot when poured on the plate. It should be used at a temperature of about 100°.

5. *The surface becomes dull after leaving the plate.*—The gelatine has not been allowed sufficient time to dry. This will also cause warping.

6. *The Eburneum is granulated and streaky.*—The coarser particles of the zinc-white have not been allowed to settle sufficiently before using, in the first instance ; and in the second, the gelatine has stood too long, so that a part has become clear and not been mixed with the white again.

Many of the above instructions will, very likely, seem unnecessary, but I have been anxious to spare you the trouble as much as possible. If, however, I have not made everything quite clear, I shall be happy to answer any questions, and shall be glad to hear of your success. J. M. Burgess.

P.S.—In late experiments I find the most agreeable warm tone obtained by developing with iron, and toning with bichloride of mercury, and hydrosulphate of ammonia ; but nothing equals the gold for a black tone.—*Phot. Notes.* B.

Goat Lane, Norwich.

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Sensitisers and De-Sensitisers of Silver Salts, and Field Photography Without a Silver Bath.

BY PROFESSOR CHARLES F. HIMES.

Nothing, perhaps, demonstrates so clearly the incompleteness of our knowledge of the forces called into play in photographic phenomina, as well as their modes of action, as the contradictory statements made from time to time by different investigators in regard to the photographic action of some substance, or the influence of some certain condition. The conditions, however, which are known to exert an influence under which experiments may be made, are indeed so varied, and so easily affected by a multitude of causes, that, leaving out of consideration those which have not been demonstrated to have an effect, we cannot be too careful in noticing all the particulars connected with each experiment, nor can we be too cautious in making positive statements or in theorising too rapidly. Nothing is easier than to mistake one cause for another in photography—to ascribe it to a certain substance, which we have happened to use; whilst the true agent in the case, or accidental change in condition which may have produced the result, has escaped notice. The recent diametrically opposite accounts given by Dr. Kaiser and Mr. Carey Lea, in regard to the action of ozone upon the insensitive iodide of silver, are utterly inexplicable from anything that appears in their respective communications, although circumstantial, whilst the character of both these gentlemen as skilful experimenters and shrewd observers is beyond question. Whilst working in the same direction I frequently met with results that were indecisive, and often contradictory. Without encumbering the columns of the Journal with a detailed statement of a series of experiments, made at intervals extending over several months, and under varying conditions, and which are therefore not easily classified or compared, a few suggestions originated by them may possess a practical value.

The investigations of M. Poitevin, which led to the conclusion that tannin acted as a sensitiser to iodide and bromide of silver, and thus played an important part as a preservative agent, apart from any other action it may exert, opened up a new view of dry plate photography; and the experiments published shortly afterward by Herr Liesegang, in the *Photo. Archiv.*, as well as those of Messrs. Bolton and Sayce, which appeared almost simultanously in this Journal, showed that the discovery had more than a theoretical value. Assuming the fact as demonstrated, I sought by aid of it to modify the tannin process in practice so as the better to suit my convenience.

In all the experiments I employed a bromo-iodised negative collodion, which gave good results wet and also with tannin. Plates coated with collodion and sensitised in bright diffused daylight were then well washed with water, and treated with a five-per-cent, solution of iodide of potassium and afterwards washed. If the iodide of potassium is not washed off, it concentrates on drying and dissolves the iodide of silver; but, upon moistening again with water, the opacity of the film is in a great degree restored. The plates were dried, some in the sunlight, others upon the stove, or spontaneously in diffused daylight; some were allowed to remain several hours, others days, and some weeks, in the light. They were subsequently sensitised at night by first thoroughly moistening with water, and then working the tannin or other sensitisers well in as usual, by causing it to flow backwards and forwards on the plate for a few minutes. They were kept for different lengths of time, and all—after exposure in the camera, upon development with pyrogallic acid and nitrate of silver, when tannin had been used as a sensitiser—gave clear, strong negatives, although the sensitiveness seemed less than that of tannin plates usually.

Attributing the diminution of sensitiveness to the employment of iodide of potassium as a de-sensitiser, I substituted for it, in the preparation of a number of plates, bromide of potassium, or cyanide of potassium—the latter of course so dilute as not to dissolve the iodide—and bromide of silver in the film. These substances seemed to destroy the sensitiveness of the silver salts as completely as iodide of potassium, and also to remove any effect the diffused light may have had upon the plates whilst passing through the various stages of preparation up to this point; whilst, as far as I was able to make a comparison, the plates that had been de-sensitised with bromide of potassium, and afterwards sensitised with tannin as usual, seemed more sensitive than those that had been treated with iodide of potassium.

In no case, however, when a de-sensitiser had been used, were the plates rendered so sensitive as when they had been simply well washed with water previous to the application of the tannin—a fact hardly to be accounted for by traces of nitrate of silver that may remain in the film, but rather by the formation of double haloid salts of silver and potassium, which of themselves are insensitive to light, and are not rendered so sensitive by means of tannin as the simple iodide and bromide of silver. Indeed the last traces of nitrate of silver may be removed by means of a weak solution of an iodide or bromide, and the plates still be rendered as sensitive by means of tannin, as if they had simply been washed with water; but as the strength of the solution is increased, as well as the length of time it is allowed to operate, the sensitiveness of the plates is diminished. The action of iodide of potassium, when iodide and bromide of silver are present, might be expressed by the formula $2\ \mathrm{Ag\,Br} + \mathrm{KI} = (\mathrm{Ag\,Br} + \mathrm{Br}) \times \mathrm{Ag\,I}$, the iodide of silver in presence of iodide of potassium being insensitive to light, as well as the double bromide of silver and potassium. If such a film, containing iodide and bromide of silver, be exposed to bright light after simply having been washed in water, it soon acquires a bluish tint, which indicates the presence of bromide of silver, a substance photochemically affected by light. I use the term "photochemically," as suggested by Dr. Vogel, to denote that action of light which is accompanied by demonstrated chemical decomposition, in contradistinction to photographical action of light, the precise nature of which we do not know, and which requires the subsequent assistance of a developing agent to become apparent.

In testing the effect of other substances, totally different in a chemical sense from the preceding, upon sensitive iodide and bromide of silver, I was led to infer that in all the preceding cases the light itself had been sufficient to produce total insensitiveness, and that the application of tannin had restored the sensitiveness destroyed by light. I accordingly prepared a number of plates by simply washing them thoroughly, after removal from the silver bath, with water, and exposed them for different lengths of time to bright diffused daylight and sunlight, and after keeping for different lengths of time, tanninised them as usual, and exposed at different times. All gave, under the usual development, clear negatives. The partial photochemical reduction of the bromide of silver, indicated by the bluish tint of all seemed to have no effect under development.

In order to test the merits of various agents as sensitisers I prepared plates as before, using in all cases iodide of potassium as a de-sensitiser. The various de-oxidising agents, inorganic as well as organic, showed a decided sensitising influence. I could not, however, notice the least effect of this nature when sulphuric acid was used, although it is supposed to play an important part as a sensitiser in a process suggested during the last year.

The whole subject of sensitisers and de-sensitisers of the haloid salts of silver is a very open one, and one that demands, in addition to great care minuteness in experimenting, actinometric observations, if comparative tests are to be made.

As a result of my experiments, I have found it very convenient to modify my method of preparing tannin plates, so as to render an occasional practice of photography less annoying, and at the same time to enable me to work up scraps and ends of time which would otherwise go to waste, into negatives. I accordingly separate the preparation of the plates into two operations. During the day, whilst otherwise employed, I can frequently slip a plate into the silver bath, wash, and treat it with iodide of potassium, and stow it aside to dry, without perceptable loss of time. When a quantity of plates prepared up to this stage has accumulated, it requires but little time and trouble to sensitise the whole of them in the evening by moistening thoroughly with distilled water, and then applying tannin as usual; in this way, all risks of encountering annoying spots arising from working with tannin and nitrate of silver at the same time is avoided.

The plates prepared in this way are, it is true, not as sensitive as those prepared in the usual way; but, with sufficient exposure, negatives with excellent details can be obtained. The plates seem to be more sensitive if iodide of potassium be not applied, in which case, however, the nitrate of silver must be completely removed by washing, or the keeping qualities of the plates will be impaired, even if defects do not appear at once.

The fears sometimes expressed in regard to exposure to light during the preparation of plates which are afterwards treated with a de-sensitising agent, seemed to be entirely groundless; and plates prepared to the point of sensitising with tannin might be found convenient in travelling, as they free photography from the drudgery of plate cleaning, and, at the same time, leave nothing to fear from custom house officers or accidental exposure to light.

A few hastily-performed experiments lead me also to believe that the silver bath might be left out of field photography at least, and yet the chief advantages of the wet process be retained. The wet process owes its superiority to its great degree of sensitiveness with comparative freedom from defects—to the rapidity of development, accompanied, as it is, with the possibility of knowing what one has upon the spot, and of making another trial in case the first is unsatisfactory; whilst dry plates require too much time and care in development to be conveniently finished on the field. These advantages of the wet process arise in part from the porosity of the film and presence of nitrate of silver—nitrate of silver being the most energetic sensitiser of the iodide and bromide. These conditions can, in a great degree, be fulfilled if dried plates which have been previously de-sensitised are thoroughly moistened and then treated with a dilute solution of nitrate of silver, by flowing it backwards and forwards as with tannin. If plates so treated are immediately exposed and developed whilst wet, by means of protosulphate of iron, and afterwards strengthened by pyrogallic acid developer, they leave not much to desire in comparison with negatives obtained by the usual wet process, whilst they allow us to reduce the large quantity of silver solution—with its inconvenient holder, so liable to breakage and leakage—to a few ounces, which can be readily carried in a phial in the pocket.

I used in the experiments made a silver solution of about fifteen grains to the ounce of water. If dust accumulate upon the plates during transport or stowage, it is plain that the washing previous to sensitising would remove all trouble from this source.

A Raid on Aniline Colors.

Mr. Editor:—I see by page 440 American Journal, April 1st, the aniline colors highly recommended. I must say I have had very poor success, not only with them, but all other colors I have used; perhaps the fault is in me.

I purchased a box of your aniline colors about two years ago, and I colored some photographs and a short time afterward they were in the face as red as blood, and I was so ashamed of them that I replaced them with new prints to get them out of sight. I then bought a box of Worden's colors, but found they dimmed the surface too much. I next bought a box of Philadelphia water colors of Geo. Dabbs & Co. I tried them and find that they take off the albumen, and so discarded them. I am looking for colors which can be applied easily and free of cost to my customers, such as do not grow in grace too much. I have seen a photograph taken and colored on Broadway, N. Y., I think at Anson's gallery, which no doubt was very fine when first colored, yet four months afterward the colors had so increased that the face looks more like beef than flesh color. On page 440 is mentioned a wax varnish, which probably has a tendency to keep the colors unchanged. I should like to know through the Journal how it is made. An operator in this state uses a varnish on his cartes de visite which I think must be similar, and it seems to improve the picture much, but he wants $25 for his secret, and I can't see the point. If you will give me any light upon the matter through the Journal or otherwise, you will greatly oblige, and I would here say that the country operators really need help on the matter of cheap and simple modes of coloring, as expensive oil or wax colors will not sell as a general thing in a farming district. Cheap work, and only cheap work constitutes at least nineteen-twentieths of all we do. ALFRED S. JOHNSON.

WAUPUN, WISCONSIN.

[We suspect that the deepening of the color alluded to, is chargeable to imperfect washing of the prints. We have never observed much change.

Wax Varnish is a solution of white wax in camphene or some other essential oil ; there is no difficulty in making it or using it.

We still think the aniline colors are the most available for cheap coloring. Professional artists however, do not use them, we suppose partly for the reason that they cannot be mixed so readily as opaque colors, and partly because they repuire different manipulation from those which they have learned to use.]—ED.

Collodio-Chloride on Opal Glass.

JOSEPH W. SWAN.

SIR,—I have lately been applying your *Collodio-Chiloride process* to printing on glass, and have succeeded so well as to induce the belief that this is one of its most valuable applications. Prints upon glass have usually been *developed* more or less in the *manner* of a negative, the printing process being only *commenced* by the action of the light, and carried to maturity by a developing solution. It has long appeared to me that the finest results in printing upon glass were to be obtained by *direct solar printing* in direct contradistinction from *development printing.* One can, by direct solar printing, obtain much finer definition and a more perfect register of the various grades of density in the negative than by development. I feel persuaded that by your process, copied negatives may be made very nearly as sharp in definition as the original, and quite as perfect in half-tone ; indeed, if the original negative be defective in this last-named quality, either by being too dense, or two transparent, the copy may be made even *better than the original.* You will think of many important uses to which this new power in photography may be applied. For instance, in the case of a very valuable negative, from which prints in large numbers are required, a good transparent print from it may be made a veritable " mother of thousands," *very nearly as good in any case* as the original, and *in some cases better.* What facility this gives for rapid printing ! Where time presses, and numbers are wanted, *ten* or *a hundred* negatives may be laid under contribution, and the work be done *ten* or *a hundred* times faster than usual ! This is scarcely a practicable thing where negatives are multiplied by development-printing. Develop how you will, *some* of the fine detail of the negative is lost, and some of the gradation too, or to say the least as to gradation, you have not the same command over it as when the whole work is done by the sun. In my first experiments I was met by two difficulties : In the first place, the film of collodion had a yrovoking tendency to leave the glass. This I overcame by coating the edges, and a narrow border of the plate, before collodonizing with ordinary negative varnish. The other difficulty was the feebleness of the image produced by the simple collodio-chloride. I found that the addition of a citric acid in minute quantity, completely, and in a most remarkable manner, removed this last-named difficulty. With this addition, one may get any degree of vigour that may be desired, and by adding more or less, can modify the character of the collodio-chloride to suit weak or strong negatives. Probably tartaric and other analagous organic acids will have a similar effect. The action of the citric acid, in so greatly increasing the vigour of the print, is well worth studying, with a view of its bearing on the rationale of ordinary silver printing. I think it throws much light upon some of the unexplained phenomena of that process.

In toning prints upon opal glass I have not succeeded so well with the mixed sulpho-syanide of ammonium and chloride of gold, as with the ordinary alkaline gold toning, and separate fixing with hypo. I have found Maxwell Lyte's phosphate of soda toning solution act excellently after being kept mixed for about a week. When freshly mixed, its action is too energetic.

Have you seen any of the opal glass portraits *coloured?* They look *very pretty indeed!* and I am told, can be done very quickly. —Believe me, Sir, very truly yours,

Joseph W. Swan.

—*Photo. News.*

Editorial Department.

———We think that the "Eburneum" photograph, described in this number, may prove the way out of some of the difficulties of the Opalotype. The process is not altogether new, and by no means perfect. But as it will now be seriously studied, it may, without doubt, soon be put in the most practical shape, and relieve us of the brittle and uneven porcelain glass. The principle of the Eburneum is sound.

The Ectograph is also another road out of trouble. This style of picture has always been a favorite with us. It was introduced to the public too soon—before photographers had acquired the skill to produce them. We expect that the Ectograph, will, phœneix like, again come to life.

———Purdy & Son, the well-known background manufacturers, have become our neighbors, and we have the pleasure quite often of visiting their *studio!* In their speciality they are no doubt the leaders, and being so near the headquarters of backgrounds, we expect to procure a great deal of useful information for our readers.

———Mr. J. W. Campbell, late photographer to Gen. Sherman, has just published a series of stereo-views of Charleston and vicinity, comprising about forty slides. As photographs, war pictures, or an exposition of the punishment of treason, we know of nothing of the kind which is superior. A set of these views ought to be placed where they will be accessible to the people in every town in the Union. Mr. C. will sell the pictures at the rate of $3 per dozen.

———Heretofore we have cared very little about the advertising patronage of this Journal. It has not been our custom to solicit advertisements; we have left it to those concerned to find out that this Journal is the best advertising medium, and those who have found it out are, as is well known, among the most reliable and enterprising of the dealers in photographic goods. Our advertising rates have indeed been about double those of other photographic journals, but as our subscription list is three or four times the length of that of any of our rivals, our rates are low. We constantly receive assurances of the satisfaction of advertisers, and especially those who send us notices for the second page of the cover. In some cases a single insertion of three or four lines has brought scores of anxious replies, repaying the advertisers a hundred fold. This department of short notices is a peculiar feature of this Journal, and we feel it a duty to call attention to it in order that its usefulness may be more generally recognized. The second page of the cover has reading matter interesting to every subscriber. We have recently observed that subscribers are considerably interested in the advertisements, and would like to have more of them. And we have observed that some of the speculators measure the respectability and utility of a photographic journal by the bulk of the advertisements. Thus a photographic journal which has a thin slice of poor reading matter sandwiched between thick masses of advertisements, on account of the proportionate bulk of these advertisements, might by one of the outsiders be pronounced to be a useful and scientific affair! We propose therefore to cater to the tastes of the subscribers who want to read more advertisements, for to please subscribers is always our earnest desire, and to the strange notions of the spectators, for we want the good opinion of everybody.

We purpose to have our printers put a little more head work on the getting up of the advertisements, so that they will be more comely to the eye, and to urge upon dealers and manufacturers to use our pages to describe their novelties. We purpose also, at the beginning of Vol. VIII to lower the rates to about that of other publications, and thus be as generous to advertisers as we have been to readers.

Minor Correspondence.

B. & P., of Mich.—"We have difficulty in flowing our plates with albumen on account of small specks in it, which appear only on the film after the picture is cleaned up. Will you be so kind as to tell us how to prepare the albumen for flowing?" ....The specks are probably particles of dust, which have fallen on the plate during the drying. To make the albumen flow well, first dip the plate in water, or pour on and off carefully till it flows evenly. The albumen must be thoroughly beaten before use.

N. T., of Ill.—"How can I convert the ashes of silvered paper and the chloride of silver into a metalic substance?" ....Mix the ashes with an equal weight of bi-carbonate of soda, and the chloride with three times its weight of the same, and smelt down in a crucible. You will probably fail the first time. A good way to reduce fresh chloride is to keep it in contact with zinc and acidulated water. But probably the cheapest process for the practical photographer to manage any kind of silver waste, is the sending of it to us for reduction.

B. F., of W. Va.—"What is the best development process for enlarging with the solar camera?" ....We have used the following with excellent success.—*Iodizing*—Iod. Potas, 7 grs., Bro. Potas, 3 grs., Water, 1 oz. *Silver Bath*—Nitrate of Silver 40 grs., Water 1 oz., Acetic Acid ½ oz. *Developer*—Saturated solution of gallic acid.

L., of Ind.—"The other day I lost an iron plate in my silver bath; having another bath set up, and being in a hurry, I left the plate in the bath. When I took it out, which was two days after, I found the edges covered with metalic silver. Now what should reduce the silver to a metalic state? The bath used was porcelain." ....The iron of the plate reduced the silver. Zinc, copper, and many other metals have the same reducing property.

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[NEW SERIES.]

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New Collodion Printing Process, Applicable to Vitreous, Enamelled, and Other Surfaces.

BY JAMES G. TUNNY.

[Read at the Photographic Society of Scotland, and reported in the Society's Journal.]

I do not know, all things considered, if I have selected the most judicious title for this paper, knowing that it is hardly possible when there are so many anxious experimenters at work, to produce anything entirely new ; for, in all probability, many have been working in the same direction, and perhaps a number of these may have actually wrought out for themselves what I may consider new in this process. But even at the risk of being told that there is nothing new—very probably informed that the whole has been previously published—I will venture to introduce to your notice, under the above christening, the process that I have the honor to lay before you this evening.

In one sense, it will not be altogether new to some members of the council of our society, as Dr. Walker and others were initiated into the secrets, if I may so call them, by which those transparencies, during the last three or four years, and prints upon enamelled glass, were produced, that I have had the pleasure of laying before the society. And now, in order that the photographic public may have the benefit of my experiments so far as they have gone, I have acceded to the request of our secretary, to give the details of the process in this paper this evening.

In the session of 1857, I read in a paper to the society the details of a process by which very beautiful positives and transparencies were produced in the camera and by development. Those pictures were named, for want of a better term, vitroheliographs. Within the last few months this process has been renewed under different titles, some of them more difficult to name than the above. Very beautiful results, no doubt, may be produced by the process I formerly described, and for some purposes it may still have its advantages : but, strictly speaking, it was not a printing process.

The specimens of my new process upon the table have been printed exactly in the same way that an ordinary plain or albumenized print is produced ; only, instead of being printed on an albumen, they are printed on a collodion-film. The first requisite is the producing of a collodion specially for this purpose. We have always been accustomed to the name of iodized collodion ; now we will become familiar with chloridized collodion ; and I have no doubt, if it is as answerable for positives as the former has been for negatives, that the commercial and photographic value of this new preparation will be quite as great. After many modifications and trials of nearly all the soluble chlorides, I think that the chloride of cobalt is the best of the many that I have subjected to experiment. 40 grs. of the chloride of cobalt to 1 oz. alcohol gives a definite strength of solution. 2 drachms of the above, added to 6 drachms of plain collodion, gives a chloridized collodion of the strength of 10 grs. to 1 oz. A considerably heavier chloridized collodion may be used by the strength of the nitrate bath being proportionately increased. Ordinary collodion is what I have used ; so there is no necessity for me giving my particular formula for its manufacture. The chlorized collodion seems to have the property of retaining all its qualities for a lengthened period. I had a considerable quantity before I went away to the East, about two years ago, and I found on trial, the other day, that it is as good as it was when it was made. Here is a sample, which, you will see, is of a beautiful blue color. Now, let us take a sheet of opal glass or patent plate, thoroughly clean it with a little nitric or sulphuric acid, then wash with water, and without drying pour over its surface a quantity of albumen diluted with ten times its bulk of water, containing 3 grs. of chloride of ammonia to each ounce, and allow it to dry spontaneously or by artificial heat. Any number of these may be prepared and kept in stock.

To make the plate ready for printing, collodionize it with the chloridized collodion in the same manner as an ordinary collodion plate; when set, it is dipped in a nitrate of silver bath, 40 grs. to 1 oz. water, rather strongly acidulated with citric acid. When the plate is thoroughly free from greasy streaks, drain it, and then thoroughly wash it under the tap. It is better, however, to have an arrangement to dry it artificially, if time be of importance. It is now laid on the negative, and printed in the usual manner; the time of exposure will be somewhat shorter than that for an albumenized paper print would be from the same negative.

The printing may be examined from time to time, as this can be done without the slightest chance of moving either negative or positive plates, by using the printing-frame I have invented for this purpose.

Here is the frame, and the gentlemen present, by examining it, will see the simplicity of the arrangement, and the accuracy of the results obtained thereby. When the print is fully up, it can be slipped from its position by the point of a penknife; and the toning may be done before or after the fixation in the hyposulphite of soda bath. Of course the toning will only be resorted to, if the color is wished to be changed. It may sometimes happen that the print may be removed before being fully printed up, for want of time to allow it to be so; in such circumstances, if the plate has not got diffused light before exposure in the printing-frame, all that is required to give it the full intensity is to place it in a bath of pyrogallic acid, about the strength of two grains to one ounce of water. The picture has to be narrowly watched, and whenever it is fully developed it should be taken and rinsed in water, and can now be toned and fixed, or fixed and toned, as above described. And as it may also sometimes occur that prints which have been fully printed, or thought to be so, may yet, after being fixed, be thought rather deficient in vigor, they also may be brought to any intensity, by being placed in the above mentioned pyrogallic bath, so that no prints need be lost, but those only which, by accident or neglect, have been thoroughly overprinted. Even these can be turned to a purpose, as they make beautiful transparencies. All the particular effects produced in ordinary printing can be obtained by this process ; it is admirably adapted for small lockets, brooches, &c., as the whole grinding and shape of the plates can be effected beforehand, and if the present novelty becomes fashionable of cementing a disc of white glass to the surface, Mr. Forrest will, in all likelihood, manufacture various sizes of ovals of opal, with corresponding sizes of white glass for this purpose. But, ultimately, I am in hopes that our watch-dial enamellers will direct their attention to this, and produce plates such as our old daguerreotype plates having an enamelled instead of a silver surface—this would get quit of the fragility of glass. Perhaps something better than either of these will be produced, especially for the larger-sized pictures—such, perhaps, as thin sheets of vulcanite covered with white enamel ; but of course, whatever preparation may be used, it would require to be impervious to the liquids of our sensitising and fixing baths. I have no doubt that all our fears of want of stability arise from the bibulous structure of our ordinary paper. When this is destroyed by varnishing or waxing the prints, I believe that absolute permanency is secured.

From one particular application of the process I anticipate, in the hands of some of our composition friends, such as Mr. Robinson, some wonderful results. For example, two or three negatives could be used in printing a composite picture on a thin opal glass, as if on paper, but with this advantage, viz., after the picture was finished (which need not be of a large size), a negative could be taken the size or sizes desired, by one of the many amplifying processes, such, indeed, as the one that has produced these beautiful specimens before us. The landscape photographer will also take advantage of this, and, by double printing, give us the beautiful effect of a natural sky—a desideratum that has long been wanted in this department of our beautiful art. See what a charm these small instantaneous views, by Wilson and England, have ; and by this process we could have small negatives, say 7 by 5 printed as I have described, and these could be enlarged by three diameters, which would give us a picture 21 by 15 inches.

The picture, by this enlargement, would lose little or none of its original sharpness, and by these means we could reduce the bulky and unwieldly traps which we are forced to carry about with us at present. I believe photodiaphanie will also receive an impetus from this process, from the ease with which positives can be printed upon polished opal glass, and the readiness with which they can be removed, in order to ornament vases and other ornamental objects,—all that is necessary being to print the picture as I have already described, only omitting the first application of the thin albumen film, then to pour over the finished print a warm solution of gelatine, and after it is dry (by the by, it is well to put a few drops of honey into the gelatine, to render it a little more flexible, for, without this, it has a little tendency to crack in the after handling). The surface is now covered with a coating of plain collodion, and, when quite dry, the picture is easily removed by passing a knife round the edge, the film being carefully lifted up. It may now be cut to any form or size that may be required. The collodion coating may be dispensed with, and when so, no varnishing is required to lay down the picture, the surface only requiring to be damped to give it sufficient adhesiveness to adhere to the object to be ornamented. The exposed surface will, of course, have to be protected with a varnish. In order to print on a convex surface, it is necessary to fall back on some other means of printing than our ordinary printing-frame, and to attain this end I cover the frame with a thin sheet of india-rubber. Of course, for this purpose the negative must be removed from the glass, this can be easily done in the same manner as I have described for lifting the positives for photodiaphanie purposes. The lifted negative is now placed upon the surface of the stretched film of india-rubber, and the prepared positive convex plate is now placed in contact with the negative, a continuous pressure being kept up. By the flexible yielding of the negative, and india-rubber, the result is a print as perfect as if it had been printed upon a plain surface. By the use of this printing-frame an inequality of surface is a very slight inconvenience. I believe positives for the stereoscope, magic lantern, and for enlargement, will be produced by this process of a quality that has not been attained by any published process that I am aware of, as we have the entire power of modifying or increasing effects as in ordinary printing.

Direct Printing on Opal Glass.

From the communications of correspondents we learn that whilst the taste for pictures on opal glass appears to be on the increase, the usual methods employed of printing by development are far from being generally successful. If sufficient exposure and development be given to secure detail, the delicate portions of the image have a tendency to be buried in the film giving fine effects by transmitted light, but looking dull and heavy by reflected light. If the exposure be shorter, or the developement be quickly checked, a slight tendency to hardness and lack of detail are the dangers incurred ; the *juste milieu* being very difficult indeed to hit : added to this is the difficulty of securing a satisfactory tone without the use of mercury or a sulphide, both of which are more or less objectionable.

It is tolerably certain that any method of direct printing on glass will possess advantages in these respects, and the result of experiment with our own process, the collodio-chloride, leads us to the conviction that it is in many respects immeasureably superior to any other method of printing on glass, which we have yet tried both in simplicity, certainty, and beauty of result.

Until recently our chief attention has been given to the application of the collodio-chloride to paper, two or three experiments with some preparation, successfully used for paper, not having been found quite satisfactory on glass, a somewhat feeble grey image being the result. It appeared to us that some trace of organic matter was necessary to secure the desired vigor and richness of color. A hasty trial of the only suitable preparation we had at hand confirmed this conviction. A plate, coated with the raisin syrup of Mr. Sebastian Davis, prepared three or four years ago, for use in the modified Fothergill process, was applied to a plate which, when dry, was coated with the collodio-chloride we had in use. This printed very rapidly, giving a rich, vigorous, brown image, which toned readily to a very agreeable color. We did not proceed further with the matter at the time, leaving the trials with other substances, such as albumen, gelatine, &c., on the glass; or resins, sugar, tannin, glycerine, citric acid, &c., in the collodion, for future trial. The last-mentioned two substances had been tried by the "Photographer's Assistant," for paper printing, with considerable success, and promised well for printing on glass.

Before we commenced to carry out our experiments we received from Mr. Swan, of Newcastle-on-Tyne, a very charming specimen on opal glass, which, he informed us, was produced by means of our collodio-chloride process. Shortly afterwards we recieved a bottle of the collodio-chloride, prepared for printing on glass, with which the specimen was produced, and Mr. Swan supplied us with details of its preparation. He had tried various organic additions, in order to get sufficient vigor, and had found that nothing gave such results as citric acid. The collodio-chloride for the purpose was prepared very nearly in accordance with our own published formula, with a little citric acid added. The proportions of sensitive salts were eight grains of nitrate of silver, two grains of chloride of calcium, and one grain of citric acid in each ounce of collodion. This collodion, we found, gave prints on glass perfect in tone and color, without the slightest difficulty.

We next tried it on paper, and although it was extremely sensitive, the results were comparatively worthless, so feeble and wanting in vigor. Here was a very curious circumstance. The collodio-chloride, which we found work well on paper, giving great vigor, did not, for several reasons, work well on glass; whilst that which gave very perfect results on glass was feeble and poor on paper. The difference in result appears to be chiefly due to the difference in the proportion of free nitrate present. In all our experiments on paper we found that the presence sufficient free nitrate of silver was the point of vital importance in securing vigor. But this amount of free nitrate in the collodion when used on glass was apt to crystallize on drying, giving a slightly mottled effect, with minute spots of insensitiveness, and a general want of vigor; whilst Mr. Swan's collodion containing less free nitrate, but having an organic body present, answered well.

We subsequently tried a variety of preliminary coatings. White of an egg one part, added to water six parts, and well beaten, applied as preliminary coating, answered well, given a rich brown image. Gelatine five grains, and water one ounce, used as a preliminary coating, gave a reddish purple image. But neither of these were so good as the raisin syrup, nor quite so good, we think, as the collodio-choloride with citric acid, without preliminary coating. In using the latter, however, a difficulty was met with at the outset, which, although it is chiefly due to the use of a very contractile collodion, the reader should be prepared for: the film has a great tendency to leave the glass. This may be overcome in various ways : we found a very efficient one consisted in coating the edge of the plate for about one-eight of an inch all around, with the dilute albumen we have described, before applying the collodio-chloride. The film then adheres perfectly, and no trouble is experienced. We may here notice an interesting circumstance which occured, which possibly may prove useful, and which appears strikingly in opposition to the theory recently referred to by Mr. Sutton, to the effect that the presence of organic matter in connection with chloride of silver promoted vigor, but decreased sensitiveness. All the plates we have tried, which have been thus coated with albumen at the edge, have shown an increased action of light at that part, giving a darker line around the edge of the plate, indicating an increase of sensitiveness, as well as accession of vigor, in the part where the very slight trace of albumen was present.

Mr. Swan, in his communication, which appears in another column, states that he finds a longer exposure is necessary than for albumenized paper, and that a great reduction takes place in the processes of toning and fixing. This is not altogether in accordance with our own experience. In our hands, the printing appeared very rapid, an excellent print of sufficient depth being obtained from a good negative with an exposure of five minutes to sunlight. It is probable that this discrepancy may be explained by the different modes of toning we employed. Mr. Swan employed an acetate bath, which he finds reduces the depth of the print very much. We happened, at the time of our experiments, to have no acetate or lime toning bath ready prepared, and as time is necessary for the fruition of these baths, we tried the simplest impromptu alkaline gold bath we could make, consisting of one grain of chloride of gold, one grain of carbonate of soda, and five ounces of hot water, using in about a quarter of an hour after it was made. The effect on a considerably overprinted impression was startling: in a moment after the first contact the impression was reduced to a very pale one, and the color changed from a rich reddish brown, bronzed deeply in the shadows, to a greyish black, which the hypo did not change at all. It is clear, therefore, that the ordinary alkaline gold toning baths, if employed, should be used very dilute indeed, and sufficiently old. We next had recourse to an old sel d'or bath we had at hand. The result of this was everything which could be desired, the impression, without being overprinted more than for an albumenized paper print, toned slowly and gradually, and lost very little in depth, either in the toning bath or the subsequent hypo fixing bath. Rich warm sepia tints, rich purple or pure blacks were easily secured by this bath.

One of the great difficulties of printing on such substances as opal glass consists in the difficulty of watching the progress of printing, as the glass cannot of course be turned back to examine like paper. There are various modes of meeting this difficulty. If the negative and glass be attached by a piece of gummed paper. the latter may with care be lifted and examined, and then replaced without moving. Mr. Tunny, whose method of printing on opal glass we give on another page, has devised a printing frame which permits the glass to be lifted and examined without any danger. Mr. Shive, in America, has patented a printing frame for a similar purpose, the negative being fixed in another half of a frame which opens on hinges, each half falling back like the covers of a book; this, when opened, permits the progress of printing to be examined, and when closed again the negative and glass come into contact again without possibility of either moving. We have devised a very simple impromptu method of obtaining the desired end. As in many cases, especially when the opal glass is intended to contain a certain miniature bust for bracelet, locket, &c., the glass is smaller than the negative, we place on the lower half of the latter, a piece of glass or card as thick as the opal glass, this supports one half of the hinged back of the printing frame. The opal glass is then placed on the negative, so that it shall only be pressed by one half of the hinged back, and when it is placed *in situ* on the negative, a little gum or india-rubber cement is placed at the back, and the back-board of the printing frame brought into contact and hasped down. When it is necessary to examine the print, the half of the hinged back is carefully raised with the opal glass cemented to it with the gum or india-rubber: when the back is shut down again, the opal glass of course falls on its proper place on the negative. It is probable we should think that suitable printing frames will soon be obtained in commerce.

The applications which may be made of this simple mode of printing on glass are very numerous. Mr. Tunny points out several for this process, and we need scarcely say that they will be equally applicable to our own. Mr. Swan refers to the advantages of reproducing negatives by such a method: as a means of printing lantern slides, also, this will probably be very valuable. For miniatures in cases, or for bracelets, &c., with a glass cemented in contact, after the manner recently adopted by Messrs. Helsby & Co., and earlier still by Mr. Skaife and Mr. Cutting, nothing can be more beautiful, or more simply produced.

There remains one thing to be wished for; an improvement in the color. Mr. Sutton has properly pointed out that the color of cream would be much finer than that of blue milk for the whites of a picture, and that opal glass most resembles the latter. A considerable improvement has recently been made by the employment of a pure white pot metal instead of a flashed surface of white; but a decided cream color or india-tint would be still more an improvement. We have recently been experimenting on various substances, such as white *papier mache*, prepared expressly for the purpose. There is a wide field of application in new directions of this kind, but we must reserve details for our next.—*Photo. News.*

Novelties.

Being somewhat of an Athenian, as well as a Gothamite, always seeking for "something new," and trying my best to keep up in the race, I was lately informed that a New Photographic Miniature, colored exquisitely, was to be seen down town. I started "post haste" to see it. I found the mare's nest? no, but Mayer's patent Typo-lite. Not being able to translate the learned title, I endeavored to translate the picture, and will briefly, if not classically, give you the benefit of said translation. It looks like a greasy type, once called Hallotype. One photograph well greased, and another well daubed behind it, behind or between glass ; they were bloody-looking things, *i. e.*, carry their purple blood on the outside, seen through an indistinct oily medium. Not unlike Barnum's wax figures. Gilt buttons, made by a daub of the end of a brush, or by throwing the brush at it, as a celebrated painter painted foam. I think it read "patent" applied for. Is there any more crimson lake ?

Again: I was reading an advertisement "To Photographers," a new Method of Varnishing Photographs by Mr. D—, late photographer to the Queen of (not Cannibal Islands). I called and learned something more. I saw several card photographs mounted, and several large proofs, one 4-4 copy of engraving, very shiny ! somewhat blistered, fastened by corners, whilst edges began to roll up. I had read in the Journal of Enamelling Prints, &c., by collodion, gelatine and varnish on glass, and being somewhat of a cute guesser, I guessed it looked amazingly like my blindness in that same line. I (of course) asked the price. Only, one thousand dollars ! and he would sell to a company of ten at "one hundred dollars per man." Thinking the process required too much gold or greenbacks, I came back green. I am glad that some of our excellent chemists describe their weights and measures with so much accuracy. In your last, you quote a celebrated Professor, and give, "add a few lumps of camphor." Our country cousins have not seen those big two pound lumps of camphor in Broadway. Is not a "few lumps" definitely indefinite.

Be careful how you use camphor! beware of the camphor patent! Yes, there is a camphor patent. In the year of our Lord 1853, or '54, J. A. C. patented the using of camphor in collodion for making ambrotypes ; he used said patent *a week* or *two*, and ruined several baths, and let it *drop*. What a just punishment it would be to compel some of the greedy patentees, *to use their own inventions*, and *high priced receipts*, in all their violations of mathematical chemistry. Do you suppose the patentees of bromide, &c., adhere to their first crude receipts and proportions? No, sir! they use the knowledge of wiser chemists and better mathematicians in chemical combinations.

Another novelty, the oval or convex surface. How delightfully huge it makes a small nose if placed in the centre, how it spreads out the circumference to a few acres more or less. It gives one an idea that the face has just received a terrible blow on the proboscis, and the rest of the face has not ceased to rebound. The makers of them have learned to dodge the centre on a more level part of the oval. The oval has many sheen points, throwing painful light or dazzle into the eye, like convex glass.

Once more :—some heads are large and some small ; how many small heads will make a large one? we thought a standee, showing all from the heels to the head on a small card, was small enough ; but what shall we say at the new style, called "*dodgers*," where two smaller heads occupy the same field, waiting for an introduction.

Are they *Lilliputians?* Is Gull-iver coming back again! If so, what *great* things we may expect? *I* am of opinion, that the best way to show the feet, would be to have one foot made and mounted on the other knee, with the two hands well spread, one gloved, holding said foot in place.

What an excellent, "classic" likeness, it would make!

P. P. P.

H. Roettger's New Patent Parallatic Solar Camera.

Many attempts have hitherto been made to supply an instrument to photographers, by means of which good solar camera prints can be made.

Those who have made use of the solar camera, with or without a reflector (direct rays) are aware of the comparatively imperfect results produced, as well as the great length of time neccessary to obtain a print.

This long-felt want, it is hoped, will now be supplied by the application of the equatorial movement ; and, by adapting a camera with suitable ajustments, to enable the operator to produce sharp pictures of any required size in a very short time.

By a very simple and ingenious arrangement, the instrument can be made to follow the (apparent) course of the sun ; or, if desired, a clock movement can be attached, dispensing with an extra employee.

They are made in a substantial manner, and not liable to get out of order.

We will describe the above camera in a future number.

PHILADELPHIA, May, 23d 1865.

[The above is by, the inventor, and he promises for our next journal a detailed description, to be illustrated by an engraving.] —ED.

Photography for the Deaf and Dumb.

[THE following item is furnished by H. L. BOLTWOOD Esq., our late associate, now in New Orleans.]—ED.

Prof. A. R. MARTIN, Superintendent of the Deaf and Dumb Asylum in Baton Rouge, La., has procured photographic apparatus for the pupils under his charge, and is teaching them the art as one of the most available means for them to earn their living. It will be an act of benevolence on the part of photographers to give any of these unfortunates employment in their galleries. Some patience wil be required in giving them a start, but they are usually quick to learn, and the satisfaction of doing a good thing will repay the extra trouble.

The American Photographical Society.

SIXTY-FIRST MEETING.

THE regular meeting of the AMERICAN PHOTOGRAPHICAL SOCIETY, for the month of May, was held at its rooms, 907 Broadway, on Monday the 8th; President DRAPER in the chair.

Mr. HULL, chairman of the committee of negotiation with other societies for the use of the society rooms, gave a verbal report of progress made. Upon nomination of the Secretary, Mr. A. F. STYLES of Burlington, Vt., was elected a corresponding member of the society; upon nomination of MR. TILLMAN, MR. JOSEPH H. LADD was elected a resident member.

Amendments to the By-Laws, which were laid upon the table at a previous meeting, were ordered to a second reading, as follows :—Amendment to section 7th. "No proposition for membership shall be considered, unless accompanied with initiation fee." Amendment to section 11th ; "In addition to annual dues, each member of the society, who is a practical photographer, shall contribute at least one photograph every three months. The Secretary shall keep an account of all photographs so contributed, and report all members in arrears at the annual meeting."

Mr. Rutherford asked for information as to who was to be included by the term practical photographer.

Mr. Hull, the mover of the amendment, stated that he intended the term should include all those who produced photographs as an article of trade, or for pleasure and experiment.

After some discussion upon the matter, the amendments were unanimously carried.

The President called the attention of the society to property yet remaining at the University.

After remarks by several of the members upon the advantage of having the whole collection belonging to the society arranged in its own rooms, the Secretary announced that a member had offered to provide the funds for a case to contain the collection, provided that he would attend to the construction or selection of the same, which he, the Secretary, would most carefully do.

Mr. Hull presented to the society twenty-four very fine sterographs from Tannin Plates.

Mr. Rutherford presented to the society a very fine Imperial Photograph of the Moon, and gave in detail a very interesting account of the condition under which the original negative was produced, on the night of March 6th, 1865. The telescope used was constructed by the late Mr. Henry Fitz, to which Mr. Rutherford had added an eleven inch objective, carefully corrected for the chemical or photographic ray. In this connection he had made use of the spectroscope, as explained by him at a previous meeting of the society. He stated that the picture presented to the society was the result of not only careful manipulation with the telescope, but, a rare coincidence, of the favorable state of the atmosphere and light, which was indispensible in the production of such detail as was exhibited in the picture. Then followed an account of the enlargement from the original telescopic negative. The manipulation of the large plates had been conducted by Mr. Mason. The original negative was about one and seven-tenths inches in diameter. This was magnified to twenty one-inches by the use of an achromatic condenser and heliostat. Mr. Rutherford gave a description of a microscopic objective,—constructed by Mr. Wallis, of Fort Lee, and connected upon the principle which he had applied to his telescopic objection. After partial trial, he anticipates being able to produce, with such an objective, a plain and distinct photographic image of the most difficult test objects. The President gave a description of the apparatus, used by his son, Dr. Henry Draper, in the production of his large Photograph of the Moon, which picture, in comparison with Mr. Rutherford's, he considered gave a fair representation of the relative merits of reflecting and refracting instruments. By request of Mr. Chapman, Mr. Rutherford gave a description of his heliostat and condenser. He found that the best results was produced by having the faces of the condenser upon or within the diaphragm point of the objective. That is, so all the light from the objective would pass through the diaphragm. Professor Seely said that he had believed that the light forming a picture should emanate from the object or points near its plane; and therefore he had used ground glass, instead of a condenser, between the source of light and the transparent picture to be copied.

Upon request of Mr. Rutherford, Mr. Newton gave some account of his process for paper negatives, but did not enter into detail, as he was making some changes in his process, which will be published in an early number of the AMERICAN JOURNAL OF PHOTOGRAPHY.

Mr. Mason inquired whether any member had used albumenized paper in the developing process. Mr. Chapman had tried such paper but did not succeed with it on account of the chloride,—having used the iron developer.

Mr Tillman stated that he had prepared a paper upon Clydonics, which he had contemplated reading before the society, but the lateness of the hour was such that he would ask the privilege of publishing his paper without a formal reading. After giving an outline of its contents, his request was unanimously granted. The society here adjourned to the second Monday of June.

New Photographic Chemical Experiments.

BY DR. HERMANN VOGEL.

Numerous experiments upon the theory of photography, upon the peculiar changes which chloride of silver, bromide of silver, and iodide of silver undergo in the light, and upon their influence upon the making of pictures by photography have, for a number of years, been made public. Notwithstanding the great attention which is now paid to this subject, and notwithstanding the interesting data which have been brought to light, still this influence has been only of a subordinate nature as regards photographic practice. The practice has advanced beyond the theory, and has taught the latter more than it has learned from the same.

This is applicable, namely, in reference to the negative process. And so far it is no wonder that the practice has found more to honor it than the theory, and that only comparatively few investigators occupy themselves with the latter, while the number of those who seek to perfect the former is legion. However, I cannot overcome the conviction that the future of photography rests only upon the thorough and accurate knowledge of the physical and chemical processes produced by light, and therefore I have indefatigably continued my investigations, of which the first part has already been made public, and I herewith give to the public the further fruit of my studies,—a series of results which, I think, will illumine the darkness which is still spread over many photographic chemical processes.

Light operates upon many chemical combinations in a manner analogous to heat.

There are many combinations which are immediately decomposed by heat, *e. g.*, oxide of silver and oxide of mercury, which, simply upon being warmed, separate into their elements; while, on the other hand, others only become decomposed by heat when in connection with a body which unites itself with one of the elements to be disengaged, as oxide of copper and oxide of iron in presence of hydrogen.

The operations of light are of a similar nature. Certain bodies, as oxide of silver, chloride of silver, and oxide of mercury become immediately decomposed by light; while others, only in presence of a body which unites with one of the elements to be disengaged, as chloride of iron, oxide of uranium, and chromic acid in the presence of organic substances (ether, paper, &c.), which absorb the chlorine to be disengaged, and eventually the oxygen. Even water is decomposed by light in the presence of chlorine, which, with the liberated hydrogen, forms hydrochloric acid. These foreign substances, which are the conditions of the decomposition of many bodies by light, play a most important part in photography, in the case when one has to do with a body directly sensible to light, whose decomposition then, by the presence of such substances, is much more energetic. I believe the entire difference between Davanne and myself, upon the question whether chloride of silver becomes reduced in light to protochloride or to metallic silver, depends simply on the condition whether chloride of silver in a pure state or in connection with organic substances, is submitted to light. In the first case, protochloride of silver is formed; in the latter, metallic silver. The action of chloride of silver and bromide of silver in the presence of light is very simple; both decompose in simple states, chlorine and bromine being disengaged, and a violet or grayish-violet body is left, which body, in nitric acid, delivers no metallic silver.

More enigmatic, on the contrary, is the action of iodide of silver. That which contains a trace of iodide of potassium does not change at all in the light, while that which has a trace of nitrate of silver becomes pale gray-green, but without a particle of iodine becoming disengaged, a circumstance which led me to the supposition that iodide of silver in general undergoes no chemical change in the light. Nitrate of silver favors the change of iodide of silver in the light to a considerable degree.

Why is iodide of silver, precipitated with excess of iodide of potassium, insensitive to light? Why is it, with an overplus of nitrate of silver, sensible to light? What is the nature of the change which the latter undergoes?

Why does the nitrate of silver promote, to such a degree, the action of light upon iodide of silver?

The darkness which lay over these operations of light became still more dense as Poitevin came forward with the strange discovery that tannin and similar substances act also as sensitizers, *i. e.*, that they promote the change of iodide of silver as well as nitrate of silver.

Tannin, a substance so entirely different from nitrate of silver —the one a means of reduction, the other a means of oxidation —acts analogously to the nitrate of silver?

Who may solve this enigma?

Long reflections, and manifold experiment grounded upon them, show me now that both bodies, nitrate of silver and tannin, however different they may be, still have something in common.

Both absorb, with great ease, free iodine. Drop solution of silver into iodide of starch, the iodine cohering follows instantly, and on this fact is based my new method of testing silver solutions. Drop solution of tannin or gallic acid into iodide of starch, it also discolors.

These facts led me to the supposition that iodide of silver acts in the light as uranium nitrate, or iron salt, *i. e.*, that it is only decomposable in presence of a body which is capable of absorbing the iodine.

To prove these suppositions, I selected a third body, which also easly absorbs free iodine, but which in its other qualities were essentially different both from nitrate of silver and from tannin, namely arsenite of soda—$Na\ O\ As\ O_3$.

Five grains of arsenious acid ($As\ O_3$), and 2½ grains of carbonate of soda were dissolved in 50 grains of water, and this solution was poured upon iodide of silver precipitated with an excess of iodide of potassium, which is insensible to light. Notwithstanding the dull light of the day, a slight dimness was perceptible in a few minutes. The next morning the iodide of silver had become of a color as green as when exposed under silver solution. The experiment was repeated in direct sunshine. Here the iodide of silver, within a few seconds, by shaking, became gray-green. A proof placed at the same time in darkness did not change in the least.

I now tried several bodies which are powerful absorbants of iodine. Next nitrate of mercury, $Hg_2\ NO_6$ as neutral as possible.

In a diffused light the insensible iodide of silver renders this solution within a few minutes green.

A second test placed in the dark remained perfectly bright yellow.

A third body which absorbs iodine is tartarised antimony, although it slowly becomes discolored by a solution of the same; more quickly by the presence of carbonate of soda; to this its relation as sensitizer was analogous. Iodide of silver in connection therewith became in the light slowly gray; more rapidly by presence of carbonate of soda.

Another body which is a powerful absorbent of iodine is protochloride of tin. I dissolved this with salammoniac in water, and put it upon insensible iodide of silver. In a diffused light it colored rapidly after a few minutes gray green, the free suspended powder, brown.

A test placed in the dark did not change in the least. Of all the four bodies here experimented with, protochloride of tin appears to be the most powerful sensitizer.

Tannin came next in its working; under this also the coarser parts colored green, the finer brown.

On the basis of these experiments, which together confirm my supposition above uttered, I think I may venture to pronounce the sentence :—Those bodies which easily chemically absorb free iodine act as sensitizers upon iodide of silver, *i. e.*, they occasion the decomposition of the same in light.

Pure iodide of silver is probably not generally susceptible of decomposition in light.

Whether the considered sensitizers suffer a decomposition even by the reception of iodine (as this will be the fact in most cases), I leave for the present out of consideration

That these substances in the same manner, according to their ability to absorb bromine and chlorine, also promote the decomposition of bromide of silver and chloride of silver in light, is a fact, which, after the above-mentioned experiments naturally follows, only their presence is not the condition of their being decomposed in light. The explanation of the enigmatical relation of iodide of silver &c., &c., has now no farther difficulty. With an overplus of iodide of potassium precipitated iodide of silver retains a trace of iodide of potassium. The latter is not able to absorb iodine chemically, and therefore no decomposition follows. Iodide of silver with an overplus of nitrate of silver contains still a trace of nitrate of silver, which iodine absorbs, and hence decomposition follows.* Independently, the trace of silver which is present can absorb only a very small quantity of iodine, therefore the preceding decomposition is only weak, and quickly ceases.† If, on the other hand, nitrate of silver is an overplus, as in wet plates, the decomposition is far more energetic and of no longer duration, and hence the greater sensibility.

Tannin acts as a sensitizer because it is able to absorb iodine equally as well as free nitrate of silver. An entire series still of other phenomena may be explained easily, and enforced from the foregoing proposition. I omit for the present to enter upon the discussion of these, retaining it to myself for the next article.

After this fundamental photographic theorem has been discovered, it will not be difficult still to find hundreds of organic and inorganic, solid, fluid, and gaseous bodies, which act in a similar manner as nitrate of silver and tannin act, and which, by nearer testing, might speedily yield important results for photographic practice.

Dry plates may be prepared, which may, when required for use, be made sensitive, possibly in the camera, by any gas forming a sensitizer; perhaps among the ethereal oils, aldehyde, and oleic acid, bodies absorbing iodine may be found which are remarkable for their ready solubility in alcohol and in ether, and which, in the negative and positive collodion processes without nitrate bath of Mr. Simpson and Mr. Sayce, may be taken as sensitizers in preference to the scarcely soluble iodide of silver, &c. &c.

I will here still call attention to one thing, viz: to the green, or in pure dissolved condition, brown, substance which is formed by the decomposition of iodide of silver in the light. This is probably proto-iodide of silver Ag_2I, through the influence of iodide of potassium upon Ag_2Cl, as a green powder, which, in appearance, entirely resembled iodide of silver which had been changed in the light.—*Photo. News.*

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* According to a private communication from my friend, Carey Lea in Philadelphia, iodide of silver, precipitated with an overplus of iodide of potassium, is, however, in a strong light, sensible to light, and he writes that he has even made pictures from it. Here, probably, the organic substances of the collodion have co-operated to an important degree. I have lately discovered that, after being exposed to the light for months, iodide of silver paper becomes brown.

† It may, at the same time, from this, be explained, why, by the change of the iodide of silver, I could discover no free iodide in the light.

BERLIN, March, 1865.

Vogel's Experiments.
Great Improvements in our Art to be Expected.

BY THE EDITOR.

VOGEL'S experiments, as detailed in the preceding article, will interest all the cultivators of the science of photography. They are suggestive of many more of the same character; and it cannot be doubted that some of them may lead directly to practical utility.

The theory on which the experiments are based is not new. I have supposed that such a theory is the prevailing one, and that it had its origin in the antiquity of our art. The only doubt in my own mind rests on the interpretation of the word absorption employed by Mr. Vogel. It is a very easy thing to arrive at the theory. It is an old dictum, that the silver salts are decomposed by light, only in the presence of organic or other matter; and it was well understood that this foreign matter took away something from the silver salts. A chemist could hardly ask himself the question,—why chloride of silver, in a pure state, is unchanged by light, while, if organic matter be present, the decomposition is at once effected, without answering it by the theory.

I have many times rehearsed the theory in conversation, and it has been explained in this and other Journals. The following is a statement of it, which may be understood by all readers.

The iodide, bromide and chloride of silver are so similar to each other in their chemical deportment, that either may be taken as the type of the other two. We take the iodide, Ag. I. Under ordinary circumstances, when pure and dry, it is not affected by light; at least it is not visibly affected by a weak light. There is a tendency to a decomposition—a strain of repulsion on the atoms, but the effect of the light is not powerful enough. The tendency needs assistance, and the assistance may be furnished by such substances as have an affinity for one or the other of the elements of the iodide. If the force required to separate the elements, be represented by 3, and the light power is only 2, there is no decomposition. If, then, a substance which has a force of affinity for the iodine greater than 1 be added, the separation is completed.

When other substances than silver salts, sensitive to light, are considered, the theory is similar. Bichromates, per salts of iron, &c., require to have some substance in contact with them, which may assist by an affinity for oxygen in eliminating that element.

There are many cases of decomposition by light, where the light seems to be the only force concerned. But in the practical operations of photography, the repulsive action of light is assisted by affinity.

About a year since I made some experiments based on this theory. I prepared a plate in the usual way for the camera, except that I washed away the free nitrate of silver with water, following the washing by a weak solution of iodide of potassium and then washing again. I now had a plate free from nitrate of silver, and upon it I poured a solution of nitrate of lead. But the exposure in the camera and treatment with the developer brought out no image. I felt disappointed, but did not lose confidence in the theory, and I am inclined to think that the experiment was not well tried, and that the theory was misinterpreted. And on this head I make the following suggestions:

The free nitrate of silver does not act as the absorbent of iodine, and it is not an excitent or sensitizer, but is the source independently of light from which the silver comes to make up the body of the image. The silver of the iodide of silver is the nucleus of the image which is afterwards built upon by the silver from the nitrate set free by the action of the developer. The element which is the absorbent of the iodine, or as I view it, which assists the decomposing action of light by reason of its affinity for iodine is hydrogen existing either as an element of water or of some organic matter. The action of the light ends with this change, and any reactions after this are of the ordinary kind. The iodine leaves the silver to form either hydriodic acid or some organic substitution compound. Whether the iodine is completely and at once separated from the silver is not material to the theory. There may be a subiodide of silver, or the action of the light and the hydrogen may be simply to bring the elements Ag and I into a permanently unstable equilibrium.

The compounds which may be used for experiment, and which would popularly be termed sensitizers, are what are known to chemists as deoxydizers. This class includes the substances used by Vogel and our ordinary developers. The action of most of these on the iodide of silver is indirect. They act by exerting a pull on the oxygen of an action of water, so that the hydrogen is freer to take the iodine. Calling the excitant P; the conditions of the atoms before the action of light may be represented thus :

$$\mathrm{Ag\,I}\quad \mathrm{HO}+\mathrm{D}$$

and after the action of light thus :

$$\mathrm{Ag}\quad \mathrm{HI}\quad =\mathrm{O}$$

or a tendency towards the condition as represented.

As a confirmation of the supposition that hydrogen plays so important a part, I have only to remind my readers of the fact that the affinity of the hydrogen for chlorine, bromine and iodine is greatly increased in the presence of light.

Chlorine, bromine and iodine, as I have intimated above, have chemical properties differing mainly in degree. Their equivalents are nearly as the numbers 1, 2, 3, and these probably express the relation of affinities ; the affinities being inversely as the numbers. A proper inference from these statements is that the iodide of silver would be easiest decomposed by light alone, next in order the bromide, and last of all the chloride. The order however seems to be reversed on experiment. This apparent discrepancy is however reconciled, when we recognize the fact that the halogens in the presence of light have a greater affinity for hydrogen than for silver ; in the experiments no precaution has been taken to exclude hydrogen.

Editorial Department.

———We have in the present number several new advertisements commending novelties, and some of them are worthy of the general attention. The crystalized albumen, for example, is an article quite new to photographers, and may meet with their favor.

This albumen will keep fresh for ever, and an ounce of it is equivalent to a good many fresh eggs.

———Dr. Vogel's experiments [see p. 542,] will have the effect everywhere to draw attention to the fundamental principles of photography. The experiments ought to be repeated and varied, and especially with a view of immediate practical application. Experiments of the same character, and founded on the same theory, can easily be multiplied; and it would be very strange if some of them should not indicate directly a useful photographic process.

Experimenters are too apt to work at random. If a theory be made the guide, an intelligent experimenter rarely does anything which is not instructive. He either demonstrates the fallacy of the theory, or finds a new application of it.

——There is some prospect that photographers are again to be harassed by the proprietors of the Cutting patents. Many of our subscribers in the Eastern States have received threatening letters from lawyers, and some of the prominent photographers in Boston have organized an association for defence. We are not informed that the threatening letters have yet reached any one who is anxious to use any of Cutting's patents, or who has infringed any of them.

The following is a copy sent to us by a subscriber of a lawyer's notice :—

"Sir, You are hereby notified to pay, at your place of business, a license fee of Twenty-five Dollars, within ten days from the date hereof, for use of U. S. Patent No. 11, 266, issued to James. A Cutting, of Boston, Mass., for Improvement in Photographic Pictures, which patent you are now infringing, or proceedings against you for such infringement will be commenced immediately.

Respectfully yours,

(The Agent's Name.)

Agents for Smyth & Hubbard, assignees of James A. Cutting,
of the State of Massachusetts."

◆

Minor Correspondence.

S. T. N., of N. H.—Our private notion has been for a long time that there is very little practical difference in the effects of the various toning baths: Gold is the toning agent, and when you get it on your print in the right quantity and condition you are successful. If a man tells us that the chloride of lime toning is the best toning, we agree that it may be the best for him, because he understands it. But we observe (privately) that the man who uses the bicarbonate of soda, or borax, &c., does just as well.

J. R. of N. Y.—There are as yet no iron white enamelled plates, but we expect to see them some day. We sadly need a substitute for the brittle white glass.

J. B. S., of Mich.—Rolling presses are in common use. The smallest (for cards) and cheapest is sold for $16 ...... Quart sand crucibles cost, by the doz. 25 cts each.

N. G., of Conn., proposes to call the porcelain pictures "Pearlotypes." Mr. Hesler, of Chicago, has made the name "Argentotype" quite famous in the northwest.

R. V., of Mass.—We are not aware that the Worthytype is in use anywhere except for experimental purposes. We believe it is patented in America.

M. O., of Ky.—We refer you to our advertising pages. It would not be proper for us to make the discrimination which a direct answer to your question would require. "Comparisons are odorous."

A. S. A., of N. Y.—"Is all the black precipitate formed by putting a solution of sulphide potassium in hyposulphite of soda bath all silver?" .... The black precipitate is sulphide of silver mixed with sulphur.

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